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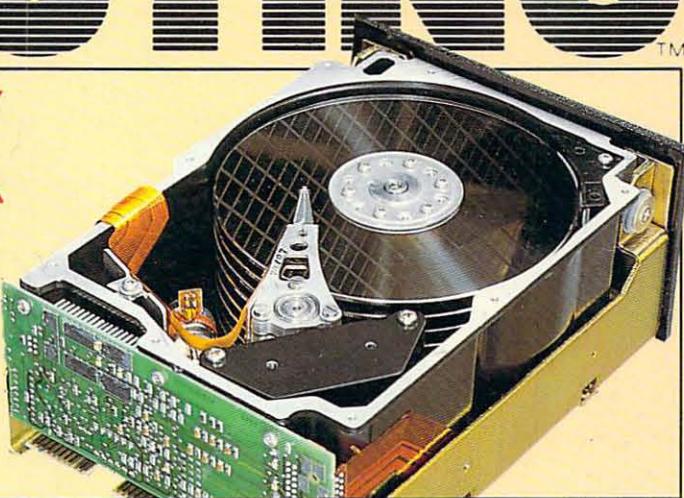
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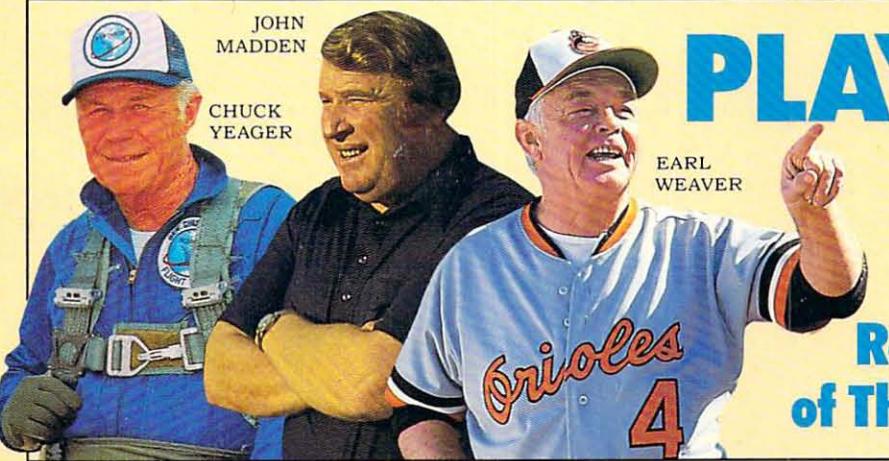
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Reviews: Tandy

1000 Portable;

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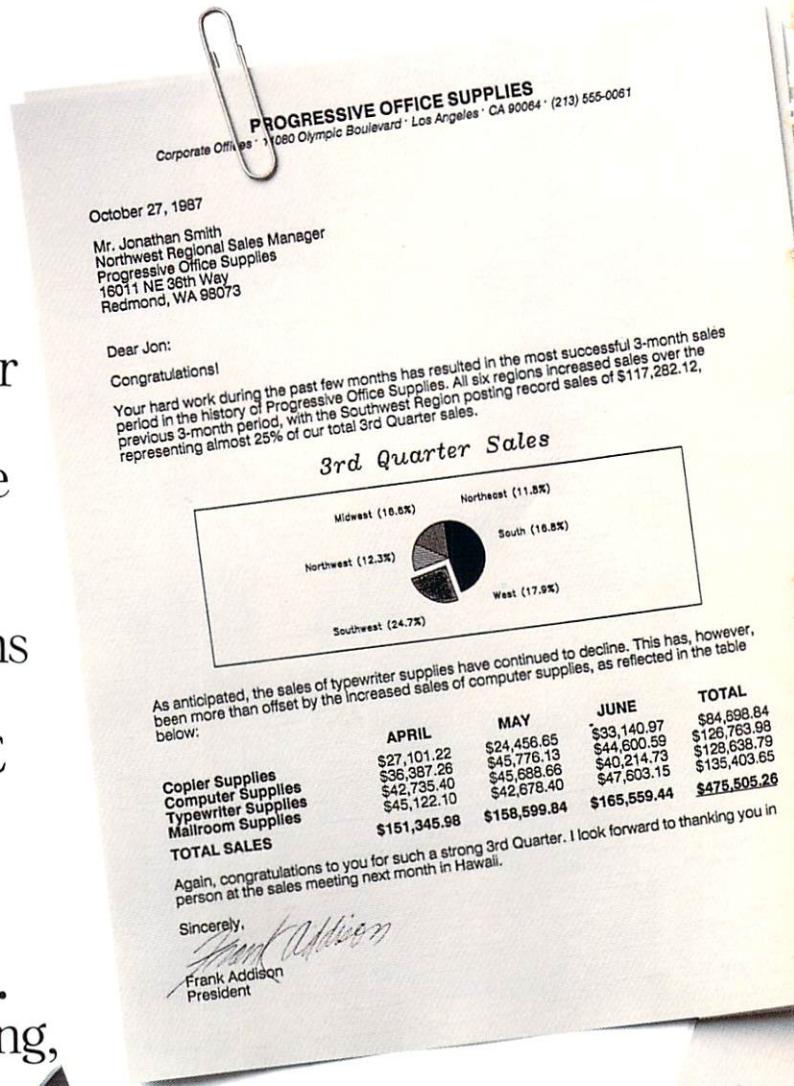
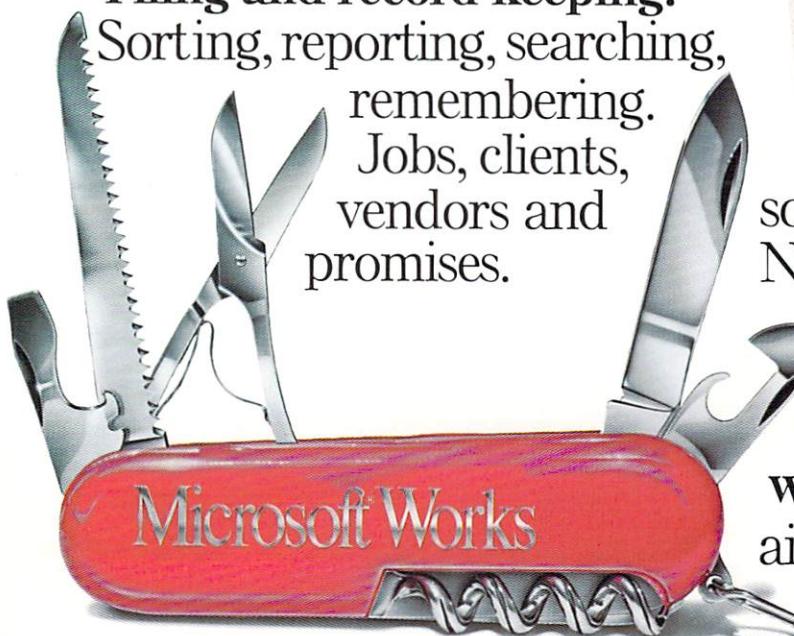
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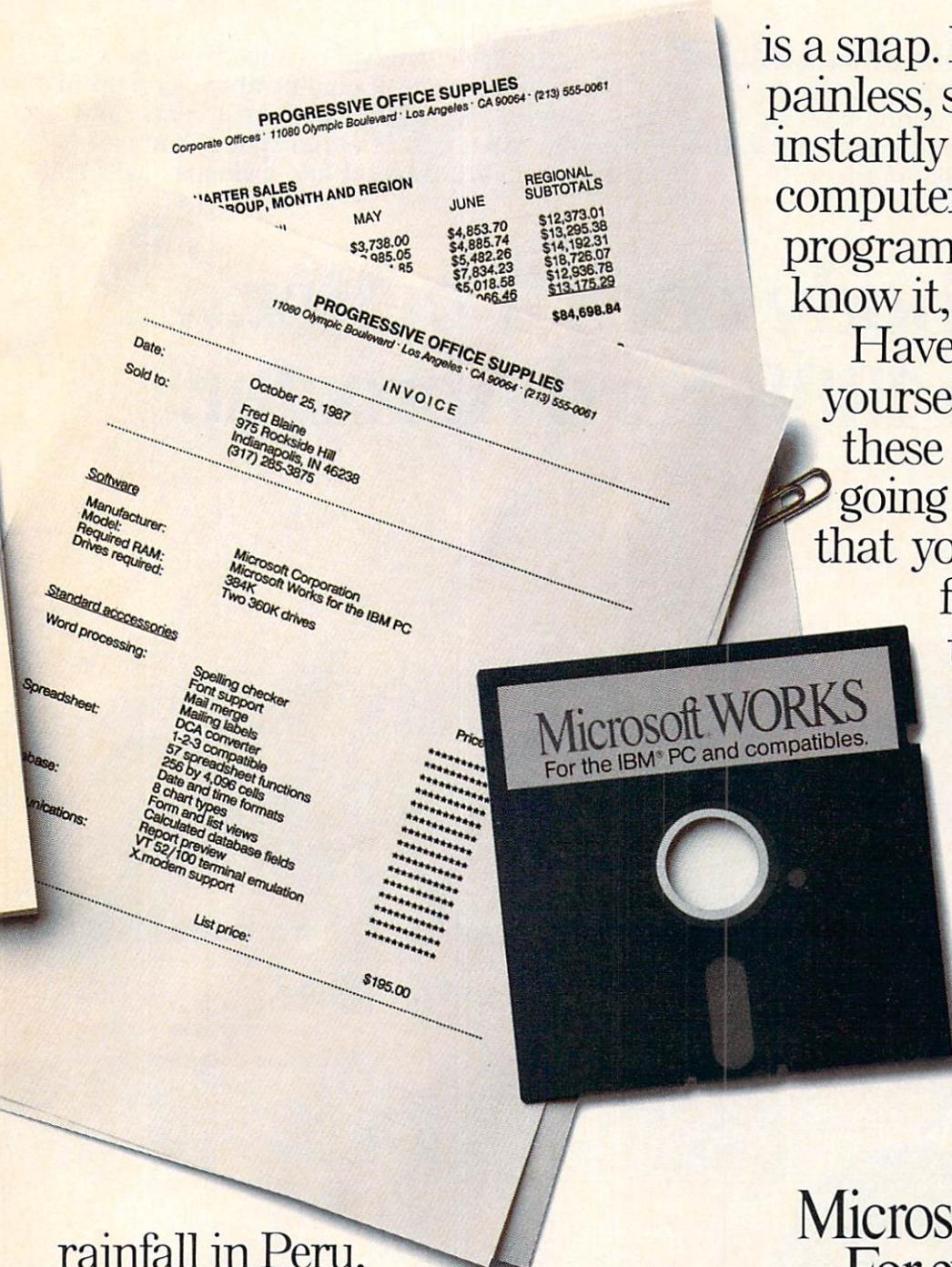


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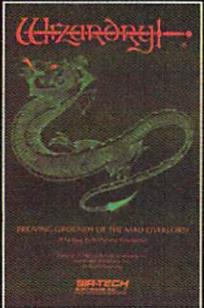
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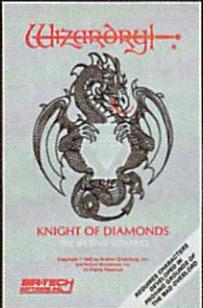


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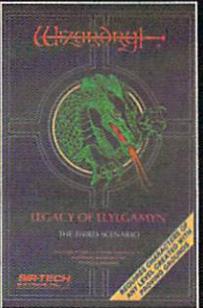
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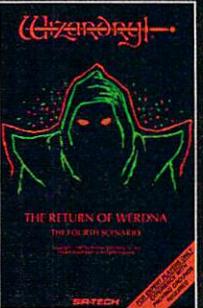
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BUYER'S GUIDE**44 HARD-DISK DRIVES**

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Compact discs (CDs), combined with computers, create interactive audio-video machines and let you access a world of information.

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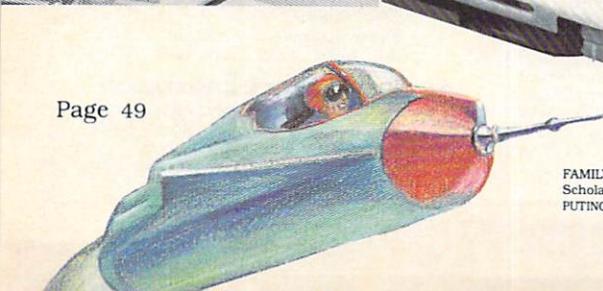
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A guide to 24 new and noteworthy programs for business and productivity, education and creativity, and entertainment, plus longer reviews of several programs.

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40 EARL WEAVER, JOHN MADDEN, CHUCK YEAGER: PLAYING WITH THE EXPERTS

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60 USING HYPERCARD

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EDITOR'S NOTE

WHEN TECHNOLOGY GOES TOO FAR

Editors are luckier than most people in one major way. We have places to vent our rage over some of life's smaller irritations and opportunities to share these views with others.

My latest beef is with the proliferation of electronic telephone-answering systems that are taking over the telephone-answering duties of human beings in companies throughout this land.

I have tried, without success, to return calls to people who work for companies with such systems. Honestly, I've always been diligent in attempting to keep up with the instructions on the recordings, but on several occasions I've been rewarded with only a dial tone. Having had several long-distance connections severed in this way, at our magazine's expense, I have now made an oath never to call some of these companies again. And I don't. (Though, as a matter of fact, I tried calling one software company while I was writing this note, just to refresh my memory about what had irked me so. The recording urged me to stay on the line for assistance if I didn't know the extension of the person I was trying to reach, but, instead of receiving help, I heard the original message repeated!)

Most of the companies I'm talking about are part of the technology industry. Their advertising and public relations copy is full of *user-friendly*'s, but if you try to contact an actual human being, there is no one with whom to strike up a friendship.

Our parent company, Scholastic Inc., has an answering system for only some staff members. If you punch in the extension of someone who's not on the system, you're told that that extension does not exist, even though it does.

The ultimate irritation came when I answered my ringing phone one day and was told that all lines were busy, but that I should wait for the next available operator. I hadn't



called anyone! Several other pleas were made for me to remain on the line before I hung up in a total snit. A minute or two later I received a call inquiring whether I had paid my latest bill for a particular credit card. "Unfortunately, I have," was my response when the caller admitted to having perpetrated the earlier call.

Don't get me wrong. I'm all in favor of personal answering machines. I'm glad I have one, and I'm glad my friends do, too. These machines make life much easier by filling formerly unfilled needs. In my view, that is not the case with all of these corporate systems. Some companies fill in with voice mail—along with secretaries, assistants, and receptionists—when a person is away from the desk. I actually appreciate such a system, which after several rings, plays a message from the person I'm calling and takes a message from me. Somehow, there's still a personal touch and the assurance that a real person will return my call before long.

What I object to is using technology to further depersonalize our lives. I'll take an occasional garbled message, a missed call, an eight-digit phone number any day, as long as the error was created by walking-talking flesh and blood. Guess I'm just old-fashioned that way.

Claudia Cohl
CLAUDIA COHL
EDITOR-IN-CHIEF



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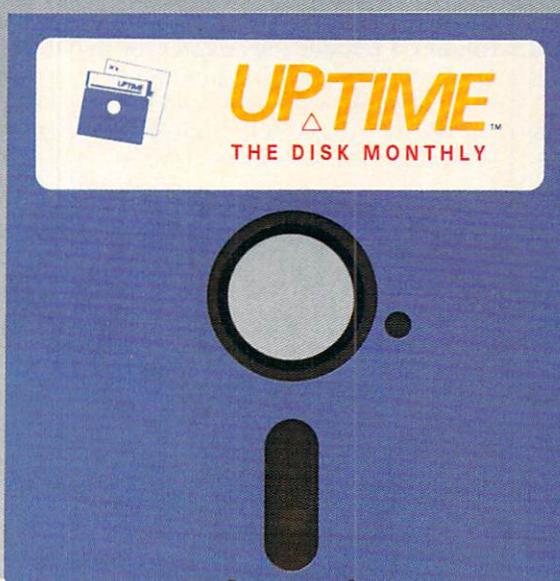
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LETTERS

RELEVANT BUSINESS ARTICLES

Your November 1987 issue was a winner, likely the most informative issue that you have published since I first subscribed.

I, like many other people, would like to find some way to earn extra cash or even go into business for myself. Articles such as the one on desktop publishing are helpful and provide incentive to search for innovative areas and/or methods to pursue my own goals.

Your article on money management in Personal Finance also struck home, as I am using Quicken to manage my checking account. I'm amazed when my account balances without great amounts of head scratching and muttering as I try to find that five-cent error.

TONY PFINGSTON
Sturgis, Kentucky

Your name change seems to fit in exactly with what I am doing. For some of us who are handicapped, our computers are windows to the outside world.

One comment: On page 58 of the October 1987 issue, Ms. Pratt answers Ms. Strasburg's question on addressing envelopes by using the DOS command. May I suggest that Ms. Strasburg buy herself some window envelopes, then have them printed with her return address (I presume she already has letterhead).

If she starts the name and address of the addressee 14 lines from the top of the screen and uses just four lines, the address should fall into place in the window, provided she starts the paper on the first line in the printer.

ALAN B. STONE
Pointe Claire, Quebec, Canada

PROMPT RESPONSE

Yes, Eric Hill (Letters, November 1987), there are many of us who prefer the A> prompt! Menu-driven systems are definitely not for those of us who enjoy using the full potential of a computer system.

Employers who plan to bring computers into their offices for efficiency and faster production should remember that command-driven systems are much faster and more versatile in a business environment.

MELODY M. STEWART
SECRETARIAL SERVICES PLUS
Woodward, Oklahoma

NO KIDDING

"Let's Not Kid Ourselves," (Letters, November 1987) revisited just one more time: There is no such thing as "user-friendly" software; just software that is less antagonistic than others.

MIKE WOLCOTT
Gainesville, Georgia

COMMENTS ON COVERAGE

I like your magazine and am glad to see that you are publishing more articles on productivity. Until recently, I felt your coverage was slanted too heavily toward Apple systems. The balance seems better now.

I am interested in reading more about Tandy's Memory PLUS Expansion Adapter, and particularly the board's DMA (Direct Memory Access) chip, in a future Machine Specifics column. I bought the adapter for my machine because some programs, notably *Rocky's Boots*, would not run without it, even though the computer had enough memory.

J.F. BROWN
Bethel Park, Pennsylvania

It appears you have made a permanent commitment to a "home business" format and strong "IBM-Apple" coverage.

As a family-oriented reader and owner of another brand of computer, your publication has become useless to me, although I wish you continued success in your chosen area.

A.L. ENNOR, JR.
Redding, California

I have just obtained my first computer and my first issue of FAMILY & HOME-OFFICE COMPUTING.

After reading the magazine, I was overwhelmed with the technical acronyms and initials in the text. The parts of your publication I could translate were very good, however, and I am not sorry that I subscribed.

TOM F. SMITH
Fresno, California

THE MONOCHROME SET

Although I use my [monochrome] computer primarily to run business programs, I also enjoy game software. Often, I'm disappointed to learn that an interesting-sounding game cannot be played on a monochrome monitor. I suggest that you review more games that can be

played on monochrome systems or indicate monochrome capability in your Software Guide.

LYNN L. CHASE
Honolulu, Hawaii

In November's Home-School Connection, you said there was a world of learning programs for IBMs with color monitors. I have a monochrome monitor, and I am surely not going to buy a color monitor just for one program. Does that mean I can't use these programs?

CORY FRYLING
Vicksburg, Michigan

EDITOR'S NOTE: Under the *Hardware Requirements* heading in our Software Guide chart, a listing of "Color monitor recommended" indicates that the program will work with a monochrome card and monitor (though its full benefits will be realized with a color monitor and color graphics card).

Of the education programs listed in the November Home-School Connection, the following will run on a monochrome monitor: Buyer Beware (MCE Inc.); Fast-Track Fractions (DLM Software); and Galileo (Infinity Software, Inc.).

PLAY FAIR ON REVIEWS

In your November 1987 issue, the "Guide to Desktop Publishing" reviews software for the Macintosh and MS-DOS machines, but does not even mention several Amiga desktop-publishing packages that have been available for a few months. One of these, *PageSetter* from Gold Disk, Inc., is, by any objective standard, equal or superior to products for the dominant machines.

Please determine what is good, not just popular—then tell us about it fairly.

GEORGE W. ZOPF
Arroyo Seco, New Mexico

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FULL-FEATURED WORD PROCESSORS

Lotus Manuscript, Microsoft Word, and *OfficeWriter*
Can Do It All

BY CHARLES H. GAJEWAY

Walk into a computer or software store, and browse through the word-processing section. You'll probably find programs ranging from as low as \$15 to as high as \$600. What in the world makes one word processor worth 40 times as much as another?

First of all, the higher the list price, the greater the number of features you're likely to get, the greater the built-in dealer margin will be, and the more the program may be discounted. Programs with a list price of \$495 are commonly sold for \$235-\$300. Second, if a program offers features that make you more productive, then it's worth more. If your time is worth \$10 per hour and word-processing program X can save you one hour per week more than can program Y—which costs \$200 less—then program X will pay for itself in less than six months!

Inversely, a program that will not perform a task you frequently need to do is worse than worthless, because you have wasted not only the purchase price, but also a lot of time and frustration trying to work around a limitation.

What you're paying for in a high-priced word-processing program is performance—more speed, more convenience, more features. Let's look at three of today's full-featured "big guns"—and see what they offer. Do you need one? Check the following list of features, and match them to your needs.

FULL-FEATURED WORD PROCESSORS

To me, advanced word-processing software must be capable of performing every task imaginable—without causing too much trouble for the user. Such programs must be able to:

- Make outlines
- Import database files to generate

CHARLES H. GAJEWAY can be reached on CompuServe (ID: 73357.3577) or on GEnie (ID: C GAJEWAY).

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Word 4.0 can import spreadsheet data to the document without conversion.

customized form letters and mailing labels (merge printing)

- Import tables from spreadsheets
- Import/convert text from other programs or text files
- Create alternating headers and footers
- Automatically generate a table of contents and an index
- Automatically create formatted and numbered footnotes
- Control printers, including laser fonts and graphics, without resorting to embedded printer commands
- Control all print formats—including variable margins, variable line spacing, multiple columns, binding margins, and leading tab characters (including periods between chapter titles and page numbers in the table of contents, for instance)
- Include graphics on the page
- Check spelling (ideally, including thesaurus and style checker)
- Search-and-replace carriage re-

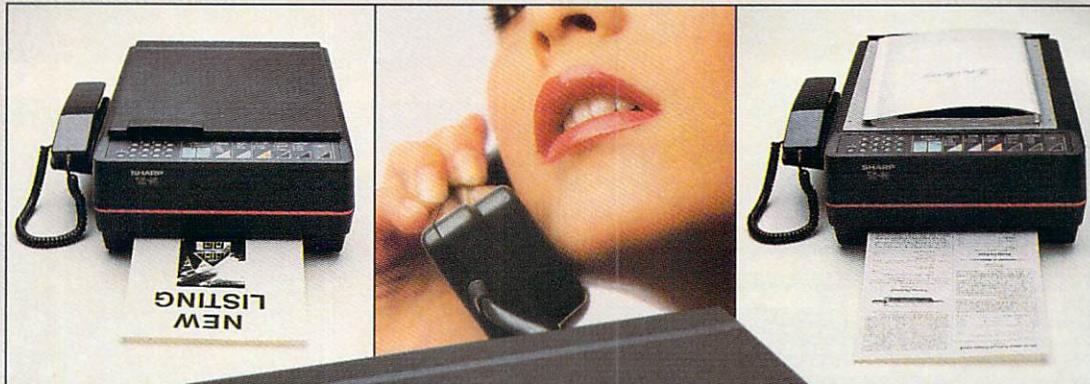
turns, tabs, and other non-text characters

- Handle large documents (50 pages or more) without slowing significantly
- Produce, as nearly as possible, a WYSIWYG (what-you-see-is-what-you-get) display

Any professionally oriented word processor should have several of these features, and several have most of them. But very few programs can do it all. My short list includes *Lotus Manuscript* for MS DOS (Lotus; \$495, 512K); *Microsoft Word 4.0* for MS DOS and 3.01 for the Macintosh (Microsoft; \$450, 320K [MS DOS]; \$395, 512K Macintosh); and *OfficeWriter* for MS DOS computers (Office Solutions; \$495, 256K).

Upcoming versions of *WordPerfect* for the Macintosh, the Apple IIgs, and version 5.0 for MS-DOS should include the above features, but were

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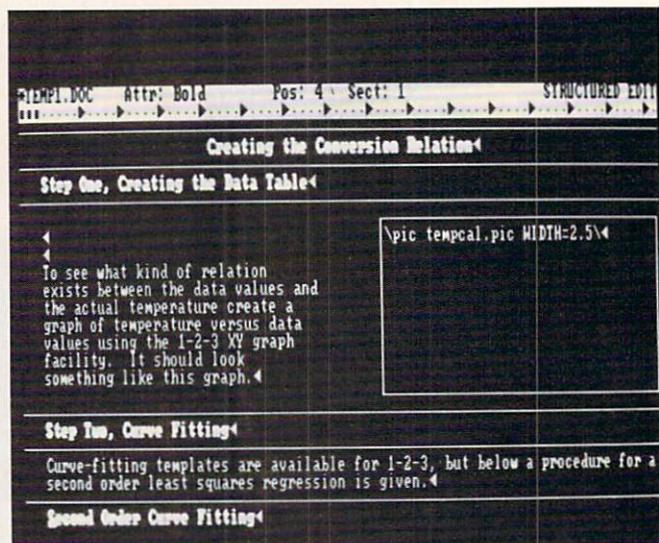
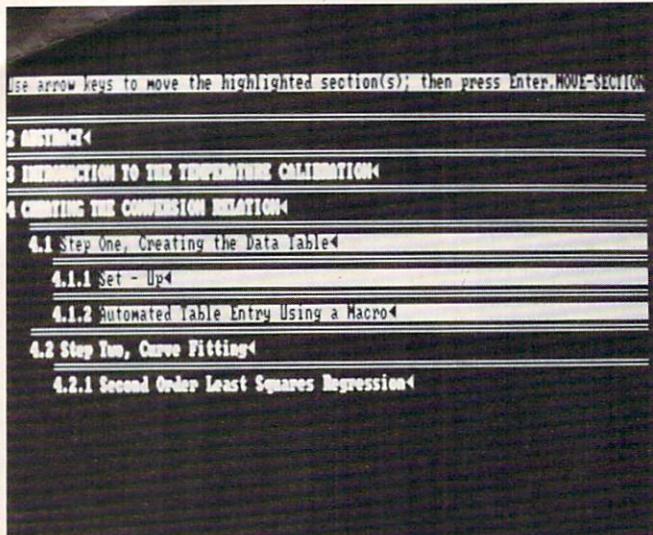
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Manuscript takes up to 2.5MB of memory and is capable of managing documents up to 800 pages long.

not available for review at press time; nor was the final version of *FullWrite Professional* (Ann Arbor Softworks; \$295, 1MB) for the Macintosh. Judging from an earlier version, *FullWrite Professional* has the most flexible graphics capabilities of the advanced programs. With such features as text-wrapping, kerning (the process of removing the extra space between certain letter combinations to make them look better), and the ability to integrate text and graphics, it approaches page-layout software.

While all of the programs are roughly equivalent in function, distinctive differences make each program best suited for a particular type of user.

Lotus Manuscript. *Manuscript* is designed mainly for creating large, technically oriented documents. It is a huge program, consuming 2.5MB on a hard disk, and it can create and manage documents of up to 800 pages. In approach, *Manuscript* builds around its extremely flexible outline capabilities, treating text and graphics as blocks that can be

assigned their own formats and attributes (headers and footers, for example) and manipulated either individually or by outline section. The program is well suited to writing technical manuals, scientific and medical documents, or complex business presentations or contracts.

Microsoft Word. The Macintosh and MS-DOS versions of Microsoft Word are somewhat different. The Mac version, naturally, uses the standard Macintosh user interface extensively. The 4.0 MS-DOS version, which allows you to toggle be-

ACCESSORIES ADD FEATURES TO YOUR WORD PROCESSOR

Many people occasionally need to perform special word-processing functions that aren't included in the software they use on a regular basis. Rather than purchasing and learning a more advanced program and converting document files, it may be easier to use add-on accessories. Here's a rundown of the more popular accessories.

Spelling/Style Checkers. Spelling checkers review words within a document file against a "dictionary" listing and stop at words that are misspelled or not included in a dictionary. The best spellers allow for corrections or dictionary additions without interrupting the checking operation. Some even operate while you type, beeping if you misspell a word!

Some spelling checkers have companion thesaurus programs that suggest alternative word usage and style checkers that flag weak or improper grammar and overused words.

Popular spelling checkers include *Spelling Checker* (Pinpoint Publishing) and *Sensible Speller* and *Sensible*

Grammar (Sensible Software) for the Apple II; *Webster's New World Combo* (Simon & Schuster Software) for MS-DOS systems; *Turbo Lightning* (Borland International), *The Reference Set* (Reference Software) and *RightWriter* (RightSoft Inc.) for MS-DOS systems; *MacProof* (a.l.p. Systems) and *Spelling Coach* (Deneba Software) for the Mac; and *Thunder!* (Electronic Arts) for the Mac and Atari ST.

Outliners. Frequently referred to as idea or outline processors, outliners are designed to assist in gathering, organizing, and presenting material in outline form. A good outline processor can both generate text and incorporate output from word processors, spreadsheets, databases, and even graphics programs.

Some programs will allow all sorts of data to be included in an outline: a table of numbers, a quotation from an electronic news service or encyclopedia, or even a picture or a graph. It's no accident that outlining is one of the main features of the advanced word processors discussed earlier; it's an extremely pow-

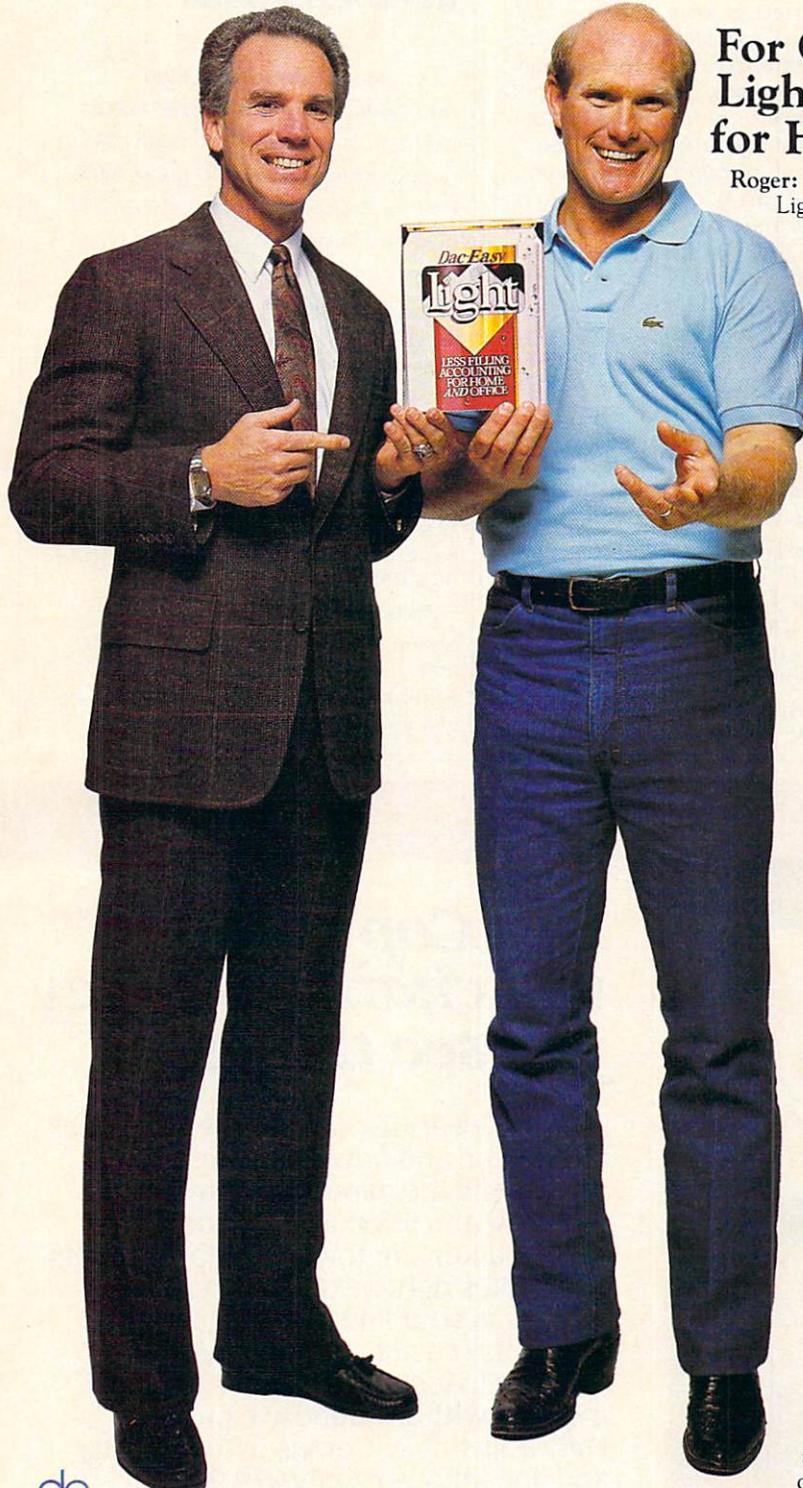
erful tool for creating complete and well-structured documents.

Outlining programs include *ThinkWorks* (Megahaus Corporation) for Apple II; *ThinkTank* (Living Videotext) and *More* (Living Videotext) for IBM PC and Mac; and *ACTA* (Symmetry) for Mac.

Others. *IndexAid 2* (Santa Barbara Software Products; \$99) for MS-DOS machines is specifically designed to assist in producing complete and consistent indexing of technical and humanities documents.

PowerText Formatter (Beaman Porter; \$50) is a complete text-formatting facility for MS-DOS machines. It can produce extremely complex formatting and merge printing from nearly any word processor that can produce a standard ASCII text file. This program has been around for some time; version 2.7 (\$150) has been updated to include laser printer control. *PowerText* can be extremely useful when an occasional project exceeds the formatting capabilities of your favorite word-processing software.

Roger Staubach and Terry Bradshaw on Dac-Easy Light.



For Once They Agree! Light's Less Filling Accounting for Home & Office.

Roger: Of course I'd never argue with you, Terry, about Dac-Easy Light because I know it's perfect for office accounting.

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Terry: Roger, when did we ever disagree about anything? You know Dac-Easy Light is perfect for home accounting. Light makes home finances fast, fun and easy. The preset home chart of accounts has everything I need. I can write checks and do bank reconciliations by computer without knowing the first thing about accounting.

Roger: Light makes it a snap to track sales and budget expenses for up to 12 months on-line. With Light, I know my business' current financial status in minutes.

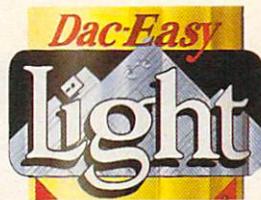
Terry: It's the same with home accounting finances, Roger. I can get my personal net worth in seconds since Light instantly reflects the effect of changes, payments, withdrawals and deposits.

Roger: Light gives me the option of handling accounting on a cash or accrual basis. Plus, if I forget any account or customer, I can quickly call it up in a window.

Terry: Well don't forget this, Roger. With Dac-Easy Light I can quickly set up new credit card accounts, post receipts, and keep tabs on current card balances. Plus, I don't have to know debits or credits because the system knows and automatically does them for me.

Roger: Terry, for once I think you're right. Light's so smooth and easy to handle, even you can use it.

Terry: And you're right, too, Rog. Using Light, you'll have more time to spend on the golf course. I just hope you're not trying to compete with my hall of fame game!



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tween text and graphics modes, has a highlighted menu structure similar to that of 1-2-3.

In contrast to *Manuscript*, both *Word* versions take what I call an "authoring" approach, in that the program lends itself to writing first and formatting later. The author can, of course, begin with a formatted outline or create standard formats that support a particular writing style.

This less structured approach to writing makes *Word* best suited for those who have little prior experience with word processing or who find themselves working on a variety of tasks. Because *Word* files are cross-compatible between Macintosh and IBM compatibles (without stripping format codes from the file), the program is ideal when files must be shared between the two systems.

OfficeWriter. *OfficeWriter* is a modular system consisting of a document-oriented word-processing program, graphics-handling software (\$145), and a communications program (\$195). Each module can be purchased and used separately or

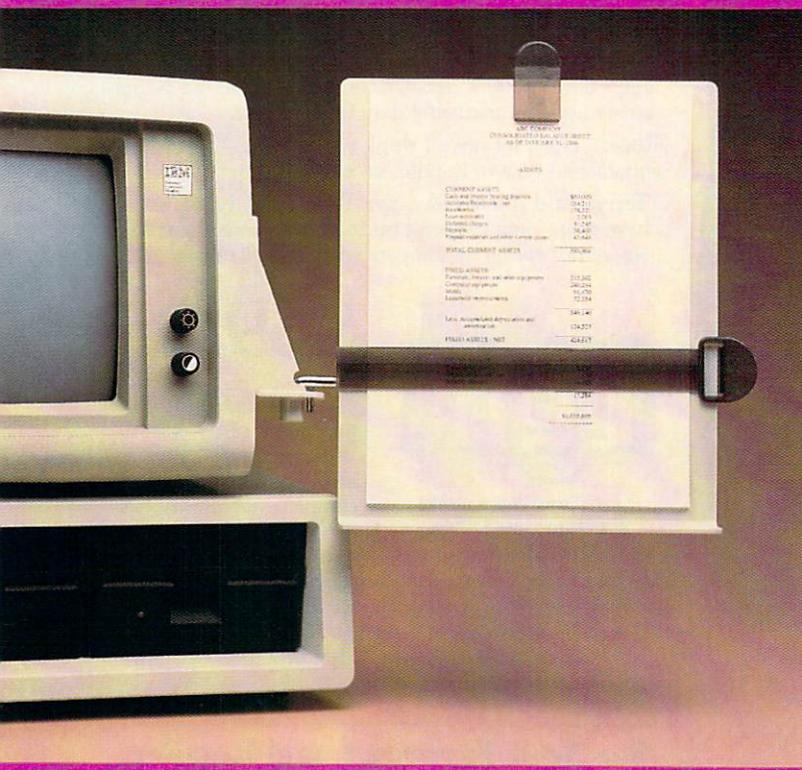
together.

Its well-designed user interface utilizes function keys, menus, and context-sensitive Help screens that make its extensive capabilities easy to use. It also has unusually flexible spelling-checker and thesaurus features. The communications module—unique among the advanced programs—can use files from several popular formats (including both Wang and IBM mainframes) and supports the XModem file-transfer protocol. *OfficeWriter*'s design and operation make it best suited for general business users or people trained on Wang systems.

Regardless of their approach, these programs contain an incredible wealth of features and functions, and I found myself constantly referring to the manuals as I experimented with them. Fully mastering any one of them would require a lot of learning and experimentation, but in return the user would become capable of handling any word-processing task with ease and confidence. Depending on your needs, that's a lot for your money. ■

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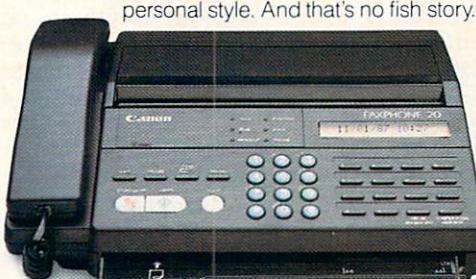
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PERSONAL FINANCE

MEET MY PERSONAL BANKER: MY COMPUTER Gain Better Control over Your Finances with Electronic Banking

BY LINDA WILLIAMS

As usual, I had waited until the last minute. This time, it was to buy a pair of shoes for a formal event being held the following evening. In between work and a dinner date, I rushed out to a shoe store and found a suitable pair. But when I tried to pay, the cashier found that I had reached the charge limit for my bank VISA card. Even if I mailed a check that evening, it wouldn't clear for several days. I panicked.

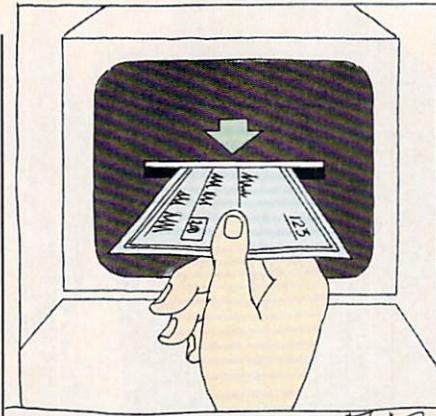
But then I remembered my personal banker, the one I can contact day or night: I use Direct Access, Citibank's electronic banking service. When I returned home from dinner, I turned on my Apple IIe and modem, dialed Direct Access, and electronically paid my Citibank VISA bill. (Luckily, since my VISA account is with Citibank, my account is credited right away.) I knew, then, that I would be free to buy those shoes the next day during lunch hour.

WHAT'S ELECTRONIC BANKING ALL ABOUT?

As you can tell, I'm an 11th-hour person—but I like organization. And when it comes to my personal finances and, more important, my freelance writing business, I need the information in one place.

Since I opened a checking account when I began working in New York City five years ago, my relationship with Citibank has grown to include checking, savings, money market, mutual fund, VISA, and discount brokerage accounts. One monthly statement includes information about all except my brokerage and VISA accounts, so roughly every 30 days I get a picture of my finances.

But one statement per month isn't enough for me. Now that I've taken a step further into the electronic age with on-line banking, I can obtain information about my finances between 6:00 a.m. and 2:00 a.m., seven days a week. And there's more. I can transfer funds between accounts



in anticipation of purchases, to cover unusually large checks, and to earn the most interest on my money. I can also read on-line information about various stocks for sales and purchases, download transaction data directly into my spreadsheet, and, perhaps most important, automatically pay up to 99 bills per month, without ever writing a check or licking a stamp.

CAN BUSINESSES SIGN UP?

If you operate a small business, the benefits of electronic banking can be immeasurable. Think of how convenient it would be to transfer large amounts of money from your savings account to your checking account and then pay all of your bills—without leaving your computer. Not only would electronic banking save you time, but you would have the freedom to transfer money at the last minute. And you don't have to do your banking from one brand of computer or even from one location. Many of the banks, including Citibank, will give you software for more than one operating system—at no additional cost.

IS IT WORTH THE MONEY?

Of course, banking via modem doesn't come without a service charge. Electronic banking at Citibank costs me \$10 per month. You may think that \$10 or so is too much to pay for banking. But before you dismiss electronic banking as an unnecessary luxury, you should consider the cost of banking without

a computer. Add up the number of recurring bills you pay each month (telephone, gas and electricity, rent or mortgage, credit and charge cards, or loans, for instance) and multiply that by 22 cents (for postage). Also, consider the amount that you pay per check if your bank has a check-processing fee.

And as the old saying goes, time is money, so you may want to consider the hours you spend on banking chores each month. While electronic banking is hardly a necessity for most people, it is a time-saver. Maybe you only have time to transfer money during your lunch hour or right after work when you're faced with long waiting lines. Or maybe you have trouble getting to the bank while it is open. If so, you'll be happy to welcome a personal banker into your home, a banker that is available almost all the time, answers all of your questions speedily, and doesn't take coffee breaks when you want to do business.

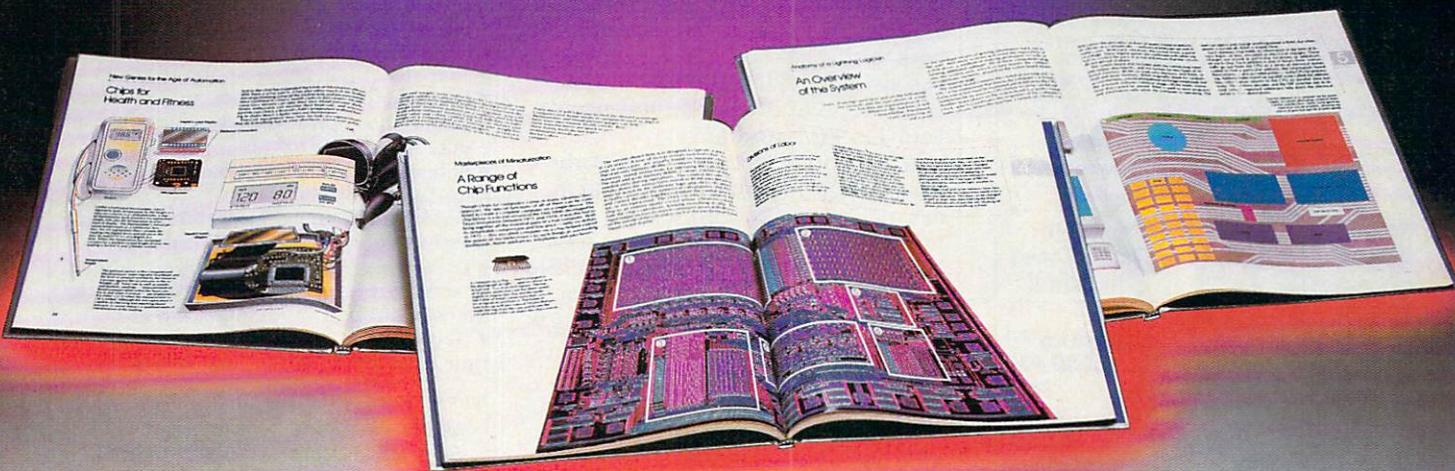
HOW DO YOU GET STARTED?

Let's suppose you're convinced that electronic banking will save money, hassles, and even a little time. Now, where do you begin? A quick call to your local bank will let you know whether or not your bank offers electronic banking and, if so, how much it costs.

Of course, you'll need access to a computer, a modem, and a phone line. If you delayed buying a modem as part of your original computer purchase, you may be pleasantly surprised to see that prices have dropped significantly. (See "A Guide to 2400-Baud Modems" in the November 1987 Telecomputing department.) Before you go out and buy one, however, find out what type your bank supports. And maybe your bank is offering a special deal on modems. Most services are geared to a range of computers and modems. However, I do know someone who replaced his Hayes 300-bps modem with the Leading Edge Model L series 1200B Hayes-compatible modem only to discover that the

LINDA WILLIAMS, a reporter/researcher for Time magazine, frequently contributes to this magazine.

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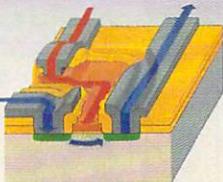
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PERSONAL FINANCE

bank's software wouldn't support the Leading Edge modem.

Once you have all the correct equipment, you're ready to take a trip to the bank and sign up. Within two weeks or so, you should receive software, a list of access phone numbers, and instructions. It's simple to access the service: Just load the software, dial the bank, and type in your banking needs.

When you get started, one of the first things you may want to do is arrange to pay certain checks automatically each month. All you do is type in the name and address of the check's recipient and the date the bank is to mail the check. The bank then sends a cashier's check with your name, address, and account number every month. Or you may want to set up recurring transfers. If your paycheck is deposited directly into your checking account twice each month, you may want an automatic transfer of some portion into your savings account. After you decide what you need done, the rest is left to your computerized service.

IS THERE A CATCH?

No one is perfect, so my personal banker does have some flaws. The greatest is that it won't dispense cash in my living room. (If that were possible, everyone would sign up!)

Some banks have dropped their home banking services, presumably because customer interest isn't strong enough. Many people would prefer to track their finances and pay their bills the tried-and-true

BENEFITS OF ELECTRONIC BANKING

Services vary from bank to bank, but the best features of my Direct Access service allow me to:

- Review, at almost any time, my accounts' activities over the past 60 days.
- Transfer funds between accounts.
- Open almost any new account electronically, without physically stepping into a bank.
- Schedule recurring payments up to 12 months in advance.
- Download financial information onto a personal computerized spreadsheet.
- Leave messages for the bank's customer service representatives, and read their notes about new or changed services.
- Get information about stocks at any time between 6:00 a.m. and 2:00 a.m.

way—using checks and a checkbook register.

And then there are other people who sign onto an on-line banking service, become disenchanted, and drop it after a few months. Some of them find that their banking needs are too simple to warrant the service fee. Others just never feel the need to monitor their transactions or don't like the idea of not receiving canceled checks each month with their bank statements.

However, for people like me who have embraced technology, it's a boon. A friend of mine who has been banking from his home office for more than two years summed up its benefits: "For just 10 dollars a month, I have greater control over my money. It's made life just a little bit easier." ■

SOME ELECTRONIC BANKING SERVICES

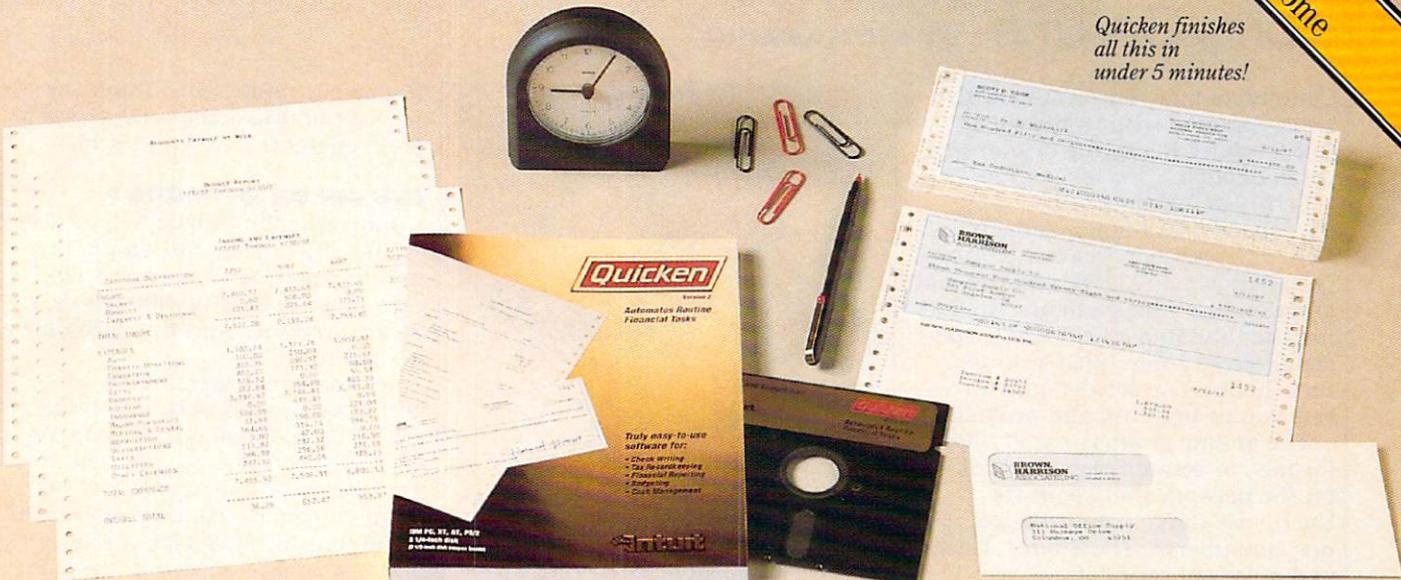
Here are a few of the banks across the country that offer electronic banking services. Although their services are available to you regardless of where you live, you might want to consider your distance from a local branch should you need to make a cash deposit or withdrawal.

Bank	Service	Phone Number
Bank of America San Francisco, CA	HomeBanking	(415) 622-3456 (800) 792-0808
Chase Manhattan Bank New York, NY	Spectrum	(800) 632-2515 (in NY) (800) 645-6300
Chemical Bank New York, NY	Pronto	(800) 832-4100 (212) 310-6161
Continental National Bank Miami, FL	Express Card	(305) 642-2440
Lloyd's Bank Toronto, Ontario, Canada	InterAction Banking System	(416) 868-8370
Manufacturers Hanover Trust New York, NY	Excel	(800) MH-EXCEL (516) 934-2154
NCNB National Bank Charlotte, NC	Cash Concentration	(704) 374-5000
Union Trust Company New Haven, CT	Pronto	(800) 426-8433 (203) 773-0500
United American Bank Memphis, TN	Bank-at-Home	(901) 766-2700

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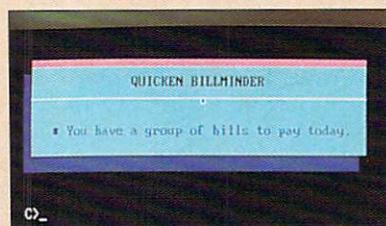
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- Compile an itemized list of tax deductions for the year: 3 seconds

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Quicken's fully automatic "macros" eliminate repetitious clerical work. Macros



Quicken remembers the bills you forgot.

remember your bills, print your checks, and update all records automatically. All you do is sign the checks.

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Quicken is easy to use because it works just like your checkbook. There's no need to change your bookkeeping format or learn anything new—no accounting jargon, no "debits," no "credits."

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"Extremely simple and fast."

Esther Dyson, Industry Analyst

"Absolutely the best small accounting program made!" *Bob Schwabach, Universal Press Syndicate*

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Hardware Compatibility: All IBM® PC, AT®, PS/2® and compatibles with 256K RAM and DOS 2.0 or higher. All printers. All monitors. Also available for Apple® IIe, IIc and GS with most of the same features.

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Number of transactions: unlimited. Maximum amounts: \$9,999,999.99. Number of income/expense categories: 250 with 256K, thousands with 512K RAM.

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TELECOMPUTING

ELECTRONIC ENTREPRENEURS

Special Interest Group Managers Find Fun and Profits On-Line

BY RIC MANNING

Computers may not seem to have a lot in common with tropical fish. But for John Benn, the two make a perfect match.

Benn, an Alabama attorney by day, spends his nights managing CompuServe's Aquaria/Fish Forum, better known as ATF Forum. He and other on-line entrepreneurs are finding that building an electronic special interest group (SIG) around their hobbies or professional interests can be both fun and profitable.

The on-line groups—called SIGs, forums, or roundtables, depending on the network that sponsors them—are the hottest thing going on CompuServe, The Source, GEnie, and other subscription services.

A typical SIG will have a message base for swapping questions and answers among members and a library of information. ATF Forum, for example, has a database on fish foods and diseases, and Ellen Kaufman's Micro Artists SIG on Delphi has a collection of picture files for different computers.

Many SIGs also sponsor on-line conferences and live sessions with special guests. Steve Wozniak took a turn on one of CompuServe's Micro-networked Apple Users' Group (MAUG) forums, and Barry Manilow was a guest on CompuServe's RockNet.

THE LIFE OF A SIG

The most successful on-line groups are the ones devoted to computer hardware or software. The IBM PC section on The Source, for example, has grown into the network's most popular SIG, said Stephen Bussmann, market development manager for SIGs. While the average SIG generates \$7,000-\$10,000 per month for the network, very active SIGs, such as the IBM PC SIG section, make much more.

But SIGs devoted to noncomputer topics also are expanding as each network reserves even larger por-



"CJs at work in RockNet's SIG control room.

tions of its service for use by hobby and professional groups. Today a modem user can find an electronic meeting place for comic book collectors, auto racing fans, scuba divers, game buffs, and model airplane builders.

And the networks are looking for more new ideas. "We have a very computer-sophisticated crowd, but it's obvious that it wants more non-computer information," said Jay Saur, manager of new products for General Electric's GEnie.

The SIG concept helps both the group and the network that distributes it. The SIG serves current subscribers and helps attract new ones, all of whom pay the network's subscription and connection-time fees. In return for bringing new subscribers to the services—and giving them something to do while they're on-line—the systems operators, or sysops, can keep a portion of the fees collected by the services.

CompuServe and its competitors keep their royalty arrangements closely guarded secrets, but the sysops say most SIG sponsors earn royalties of about 10 percent. In other words, for every \$12 the network collects for an hour of on-line time spent in a SIG area, the SIG manager earns \$1.20.

But even though 10 percent might be the average, royalties "are very much negotiable," said Gary Arlen, a Washington-based consultant who works extensively in the videotex industry. "I hear and see figures in the

10 percent range, but I think there are a lot of trade-offs. A clever sysop could engineer a different deal."

THE COLOR OF MONEY

John W. Gibney, who helped develop the SIG concept at CompuServe, said he knows SIG managers who earn more than \$100,000 per year. Some, however, start out with only a free account.

For some managers, the work is profitable enough to be a full-time job. Mike Todd, who runs the IBM PC section on The Source, said the work generates one quarter of his annual income. "It's certainly something that involves a lot of money and has a lot of potential," he said.

Patricia Fitzgibbons has a law degree, but she spends most of her time—about 40 hours a week—running two CompuServe forums devoted to electronic games. "A person of modest needs can make a very good living managing a successful forum," she said. "But it's only a very few of the forums that bring in the megabucks."

Among the noncomputer SIGs that are doing well is CompuServe's RockNet. The forum was developed by Jim Palozola and Les Tracy, two rock radio veterans who package a mixture of rock news and features with the ambience of live radio disc jockeys. In addition to the message bases and a library of computer music software, RockNet's CJs—computer jockeys—are on-line live every evening to rap about rock and roll.

Palozola said RockNet has a staff of 10 people, including the CJs, plus freelance reporters and contributors, most of whom work part-time. Palozola said he and Tracy also work part-time, but that "within the next year, it will take all of our time" as the concept grows. RockNet has about 25,000-30,000 members, and Palozola says both membership and connect time are increasing.

WHY DO IT?

For most SIG managers, the return is rather modest. "Basically, it pays for buying yourself a computer," said Benn. →

RIC MANNING writes about computers for the Louisville Courier-Journal. He receives electronic mail on The Source (ID: STQ007) and CompuServe (ID: 72715.210).



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PC MAGAZINE Glenn Hart, PC Magazine May 12, 1987, Page 36.

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The National Law Journal

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TELECOMPUTING

Paul Edwards, who along with his wife, Sarah, runs CompuServe's Working from Home Forum, said they earn enough to help pay their phone bill. "But there are other satisfactions and rewards that make it worthwhile," he said. The couple uses the forum to collect case studies and anecdotes to use in their books, seminars, and audiotapes.

Ron Solberg, a Chicago public relations executive who manages CompuServe's forum for public relations, marketing, and advertising professionals, also agreed that income from the SIG is modest at best. "It's really a pittance," he said. "I don't know that I can ever be adequately repaid for my on-line time."

But Solberg said the return is steadily increasing as more members join the forum. More than 3,000 CompuServe subscribers are regular or occasional visitors to the SIG, he said, and more than 50 new members sign up each month.

SELLING YOUR IDEA

Although the on-line network operators say they are interested in new ideas for special interest

ON-LINE SERVICES THAT WELCOME SIGS

For more details, here's a list of the on-line consumer services that welcome special interest groups:

CompuServe
CompuServe Information Service
5000 Arlington Centre Blvd.
P.O. Box 20212
Columbus, OH 43220
(614) 457-8600, (800) 848-8199

GENIE
General Electric Information Services
401 N. Washington St.
Rockville, MD 20850
(301) 340-4000, (800) 638-9636

Delphi
General Videotex Corp.
3 Blackstone St.
Cambridge, MA 02139
(617) 491-3393, (800) 544-4005

The Source
Source Telecomputing Corp.
1616 Anderson Road
McLean, VA 22102
(703) 734-7500, (800) 336-3366

Byte Information Exchange (BIX)
Byte (McGraw-Hill)
One Phoenix Mill Lane
Peterborough, NH 03458
(603) 924-9281, (800) 227-2983

Q-Link (for Commodore only)
8619 Westwood Center Dr.
Vienna, VA 22180
(703) 448-8700, (800) 392-8200

groups, they also say breaking in is becoming more difficult.

"I've got so many proposals that I've been telling people they'll have to wait a couple of months before I can even respond," said GENIE's Saur.

"We're looking for quality at this point," said Dave Kishler, supervisor of corporate communications at CompuServe. "We have 400 products on the service, and we're primarily interested in enhancing them, not in a wholesale expansion program."

Most of the on-line consumer services have information kits they will send to people who want to manage special interest sections.

Among the factors the network officials consider when they review a SIG proposal are these:

- Is the subject new?
- Is there built-in support?
- Does the sysop have on-line experience?
- Does the sysop have management and marketing skills?

Having a proposal accepted is only half the challenge. The networks all have specified levels of performance they expect SIGs to meet.

DIGITAL PIPELINE

A successful SIG manager can usually find ways to expand. Fitzgibbons did so well with The Gamers' Forum that CompuServe asked her to manage its forum for MultiPlayer games.

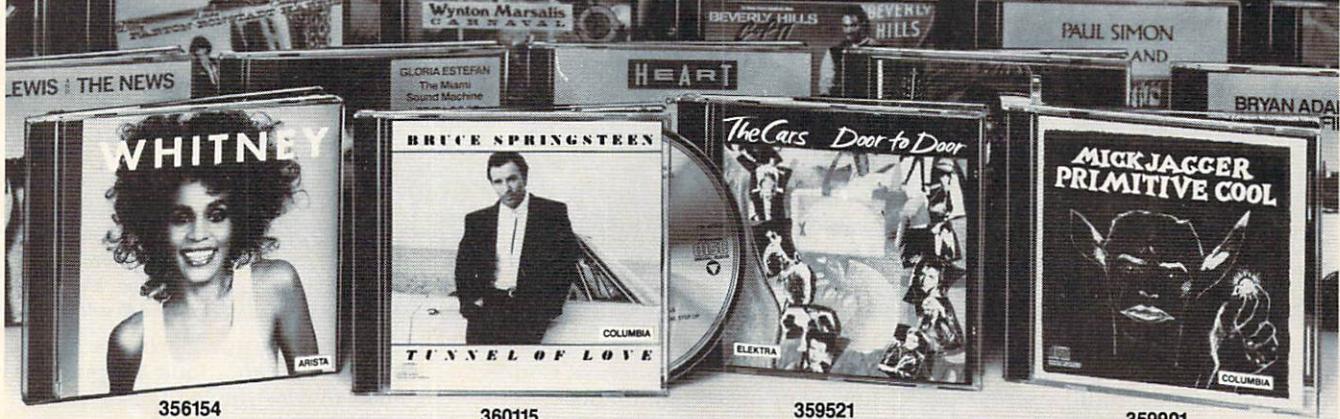
And Palozola has his eye on a RockNet version for Minitel, the national on-line network operated by the French PT&T Telephone Company. Palozola said Minitel encourages electronic entrepreneurs, some of whom, he said, "are making hundreds of thousands of dollars."

Similar opportunities for electronic entrepreneurs may open up if their regional Bell holding companies are allowed to enter the computer information business. Bell-South Corporation and some of its siblings say they want to be digital pipelines for various electronic services.

Palozola, for one, thinks the world of electronic information is just beginning to grow. "I equate this industry [at this time] to where FM radio was in the 1950s," he said. "There are a lot of people doing it as a labor of love. It's not yet a place to get rich. But one of these days, there are going to be computers in everybody's home, and this is going to be a really big thing." ■

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347955. Huey Lewis & The News—*Forever* (Chrysalis)

349985. Johnny Mathis/Henry Mancini—*The Hollywood Musicals* (Columbia)

348979. Tina Turner—*Break Every Rule* (Capitol)

352633. Dolly Parton/Linda Ronstadt/Eddy/Mary Harris—*Trix* (Warner Bros.)

336396-396390. Billy Joel's Greatest Hits, Vols. 1 & 2. (Columbia)

347153. Cyndi Lauper—*True Colors*. (Portrait)

346643. Andreas Vollenweider—*Down To The Moon*. (CBS)

356675. Beverly Hills Cop II—motion picture soundtrack album. (MCA)

349571. Boston—*Third Stage* (MCA)

356287. Suzanne Vega—*Solitude Standing*. (A&M)

291435. Led Zeppelin IV. (Atlantic)

257279. Bruce Springsteen—*Born to Run* (Columbia)

138586. Bob Dylan's Greatest Hits (Columbia)

319541. Elton John—*Greatest Hits*. (MCA)

318089. Michael Jackson—*Thriller* (Epic)

357889. Copland: *Billy* The Kid; Appalachian Spring; etc.—Bernstein, NY Phil. (Digitally Remastered—CBS Masterworks)

356667. Heart—*Bad Animals*. (Capitol)

359208. Loverboy—*Wildside*. (Columbia)

357871. Tchaikovsky: Waltzes—S. Comissiona and Houston Symphony (Digital—Pro Arte)

355834. David Bowie—*Never Let Me Down*. (EMI America)

346536. The Monkees—*Then & Now...The Best Of The Monkees* (Arista)

287003. Eagle's Greatest Hits 1971-1975 (Asylum)

350736. Rolling Stones—*Rewind*. (Rolling Stones Records)

346957. Steve Winwood—*Back In The High Life*. (Island)

344622. Anita Baker—*Rapture*. (Elektra)

31996-39998. Motown's 25 #1 Hits From 25 Years. (Motown)

291278. The Doobie Brothers—*Best of the Doobies*. (Warner Bros.)

345777. Peter Gabriel—*So*. (Geffen)

308049. Creedence Clearwater Revival Featuring John Fogerty/Chronicle. 20 greatest hits. (Fantasy)

343582. Van Halen—*5150*. (Warner Bros.)

219477. Simon & Garfunkel's Greatest Hits. (Columbia)

348649. Pachelbel Canon & Other Digital Delights—Toronto Chamber Orch. (Digital—Fanfare)

353771. Bolling/Rampal: *Suite #2 for Flute & Jazz Piano Trio* (Digital—CBS)

348318. The Police—*Every Breath You Take*—*The Singles* (A&M)

336222. Dire Straits—*Brothers In Arms*. (Warner Bros.)

341073. Steely Dan—*A Decade of Steely Dan*. (MCA)

314997-394999. Stevie Wonder's Original Musiquarium I. (Tamla)

348110. Buddy Holly—*From The Original Master Tapes*. (Digitally Remastered—MCA)

351122. Europe—*The Final Countdown*. (Epic)

346544. Kenny G—*Duetones*. (Arista)

344721. Lionel Richie—*Dancing On The Ceiling*. (Motown)

355156. Vladimir Horowitz Plays Favorite Chopin (Digitally Remastered—CBS Masterworks)

352948. Wynton Marsalis—*Carnaval*. Hunsberger, Eastman Wind Ensemble. (Digital—CBS Masterworks)

353946. Bryan Adams—*Into The Fire*. (A&M)

355115-395111. Prince—*Sign 'O' The Times*. (Paisley Park)

356873. The Outfield—*Bangin'*. (Columbia)

355990. Motley Crue—*Girls, Girls, Girls*. (Elektra)

355362. Whitesnake. (Geffen)

357467. Sammy Hagar. (Geffen)

357350. The Duke Ellington Orchestra—*Digital Duke*. (Digital—GRP)

354829. Lisa—*Lisa And Cult Jam With Full Force—Spanish Fly*. (Columbia)

345751. Paul Simon—*Graceland*. (Warner Bros.)

356279. Gloria Estefan And Miami Sound Machine—*Let It Loose*. (Epic)

313031. Yes—*Classic Yes*. (Atlantic)

357616-397612. The Best Of The Doors. (Digitally Remastered—Elektra)

353102. Jimi Hendrix—*Are You Experienced*. (Reprise)

357863. Barbra Streisand...*"One Voice"*. (Columbia)

357657. Beethoven: *Piano Concerto No. 5*. Murray Perahia. (Digital—CBS Masterworks)

357640. Wynton Marsalis—*Marsalis Standard Time*. (Columbia)

356501. Benson/Klugh—*Collaboration*. (Warner Bros.)



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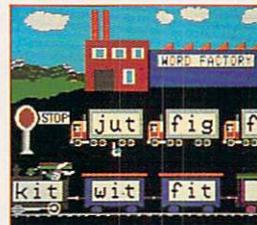
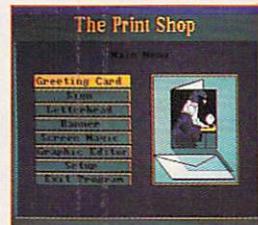
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HOME-SCHOOL CONNECTION

TOP TEN EDUCATIONAL PROGRAMS

Software That Families like Yours Are Buying

BY LISA WU



For software salespeople, parents of school-age children can be tough customers. Quenching parents' insatiable thirst for educational software isn't an easy mission; not only do customers need to know what notable educational programs are available for their computers, but, before they buy, they also want proof that the software works.

We decided to find out what educational software packages customers are buying these days—and what kind of mileage they're getting out of these programs. Even though the range of choices is overwhelming, the same programs seem to place consistently at the top of software dealer and distributor best-seller lists. Furthermore, we found that not only do they sell well, but they also have won awards and are highly recommended by parents, educators, and students.

Some of these titles have been around for a long time. Indeed, families new to computing often start by buying the classic word-of-mouth products. In this alphabetical list, we look at 10 of the educational programs that are currently selling well, and we talk to those who have helped make them best sellers—our readers.

AND THE BEST SELLERS ARE . . .

■ Barron's Computer Study Program for the SAT prepares students for the Scholastic Aptitude Test. Created by the well-known publishers of the book version, this package offers two timed, model SAT exams, a diagnostic minitest, practice questions and drills, and different study plans to suit varying time constraints. Choose a 10-week comprehensive, two-week concentrated, or two-day crash plan. (For a closer

look at SAT study programs, see next month's *Home-School Connection*.) For ages 15 and above. (\$50; 128K Apple, 128K IBM PC, Macintosh. Barron's Educational Series, 250 Wireless Blvd., Hauppauge, NY 11788; [516] 434-3311).

■ *Early Games for Young Children* incorporates colors, shapes, letters, and numbers to teach early math and language skills to preschoolers. This package covers number and letter recognition, matching, counting, addition, subtraction, and more. It's also an exciting introduction to computers. For ages 2–6. (\$35–\$50; Apple, C 64/128, IBM PC, Macintosh. Springboard Software, 7808 Creekridge Circle, Minneapolis, MN 55435; [612] 944-3915.)

■ *Learning DOS* is an interactive course for beginners and experts alike on the difficult-to-conquer PC operating system. The step-by-step exercises cover everything from DOS commands, to special DOS files, to batch files.

The program has been hailed by many who have learned to work with DOS. A friend of mine who recently switched from an Apple IIe to an IBM compatible says that *Learning DOS* has been the key to her MS-DOS proficiency. "Everything is so well-explained that you can carry out the operations right away and get immediate rewards," she said. "Whenever I need to refresh my memory about a command or term, I pull up the *Quick Reference Guide*, which is installed on my hard-disk drive." For all ages. (\$50; IBM PC. Microsoft Corp., 16011 N.E. 36th Way, Redmond, WA 98052; [206] 882-8080.)

■ *MasterType* is a typing program that incorporates drills for speed and accuracy. All the letters, numbers, and symbols are covered. Lively graphics enhance each typing game, and the score is tallied at the end.

Becky Woodin, a 16-year-old En-

glish honors student who lives in Chubbuck, Idaho, took a typing course to ease the load of frequent writing assignments. She sped up her progress by using *MasterType* at home. Now Becky writes and edits all of her English papers on the computer. Her mother is a firm believer in the importance of typing in relation to computer literacy: "I've told all my children that they must learn to type." For ages 7–adult. (\$40–\$50; Amiga, Apple, Atari, C 64/128, 128K IBM PC, Macintosh. Mindscape, 3444 Dundee Road, Northbrook, IL 60062; [312] 480-7667.)

■ *Math Blaster!* gives kids practice in basic math skills—addition, subtraction, multiplication, and division—and also in computing fractions, decimals, and percents. Colorful pictures, fun games, and positive reinforcement encourage the kids as they learn.

Math Blaster! marked the turning point in 11-year-old Lisa Feldstein's performance in math classes. In the third grade, the Amherst, Massachusetts, student was an average math student. But she was determined to do better in multiplication and, with *Math Blaster!*, she concentrated on the drill-and-practice multiplication section at home. Her father pointed out: "One of the best things about the experience was that Lisa boosted her self-confidence in math. It was a self-fulfilling prophecy: She decided she was going to succeed, and she did. Now math is her best subject, and she expects to continue doing well." For ages 6–12. (\$50; Apple, Atari, C 64/128, 128K IBM PC. Davidson & Associates, 3135 Kashiwa St., Torrance, CA 90505; [213] 534-4070.)

■ *The Newsroom* is a sophisticated yet easy-to-use program that lets people of all ages design, produce, and print newsletters using various typestyles and clip art.

The Newsroom was the first soft-

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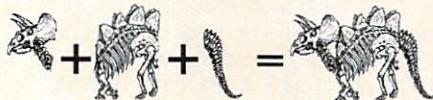
This fascinating new dinosaur program is actually three fun-filled activities in one.

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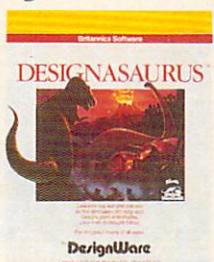


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FAMILY & HOME OFFICE COMPUTING

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HOME-SCHOOL CONNECTION

ware package that the Mitteagers, from Cooperstown, New York, purchased; the family's first project was a newsletter for relatives and friends. The journalism experience paid off for 14-year-old Wendy. Her father, Jim, who is a writer, said, "Newsroom encouraged Wendy to write and exercise her own judgment with layouts and pictures." Last year, she was recording secretary for her 4-H club and named outstanding reporter of the year in her county. For ages 10 and above. (\$50–\$60; 64K Apple, C 64/128, IBM PC. Springboard Software [see page 24 for address and phone number].)

■ *The Print Shop* lets children create and print greeting cards, stationery, banners, and more using assorted graphics patterns, typestyles, and clip art. This program has been a hit with our readers since it was first published three years ago.

Paula Galland, of St. Simon's Island, Georgia, whose family was second-place winner in our 1987 Computing Family of the Year Contest, told how a graphics program motivated her son to write thank-you notes. "Somewhere there may be a 10-year-old boy who likes to write thank-you notes, but I assure you that he does not live here. At Christmas I encouraged Max to design thank-you notes [for the presents he received] using *The Print Shop*. He would only have to change the name of the gift and giver for each note. It was a tremendous success!" For ages 5 and above. (\$45–\$60; 64K Apple, Apple IIgs, C 64/128, 128K IBM PC, 512K Macintosh. Broderbund, 17 Paul Drive, San Rafael, CA 94903; [415] 492-3200.)

■ *Reader Rabbit* builds early reading and spelling skills while it increases young children's vocabulary. The word and letter patterns help develop visual discrimination, concentration, and memory skills. A playful rabbit guides youngsters through more than 200 three-letter words. For ages 4–7. (\$40, digitized voice version for 256K Apple IIgs costs \$60; 64K Apple, C 64/128, IBM PC. The Learning Company, 6493 Kaiser Drive, Fremont, CA 94555; [415] 792-2101.)

■ *Typing Tutor IV*, another typing program on our best-seller list, teaches the keyboard one row at a time and records your accuracy, speed, and specific problems. The program then tailors subsequent lessons to sharpen your weak spots. An arcade-style section adds fun to the

learning process, and on-screen assistance is available by pressing a key. For all ages. (\$40–\$60; 64K Apple, 256K Apple IIgs, C 64/128, 128K IBM PC, 512K Macintosh. Simon & Schuster Software, One Gulf + Western Plaza, New York, NY 10023; [212] 373-8882.)

■ *Where in the World Is Carmen Sandiego?* and *Where in the USA Is Carmen Sandiego?* put children in the role of crime busters on the trail of the infamous Carmen Sandiego, who's snatching up national treasures left and right. Along the way children learn world and United States geography. As detectives, they research places, facts, and clues in *The World Almanac and Book of Facts* and *Fodor's USA* travel guide. The programs incorporate elements of graphic adventures, trivia games, mysteries, and arcade animation.

For Jenny, 16, Ellen, 13, and Tara Smith, 9, of Celina, Ohio, *Where in the World Is Carmen Sandiego?* is a family affair. With *The World Almanac* handy, all three girls have become familiar with national landmarks, exports, and imports. "More than anything else," said their mother, Janet, a schoolteacher, "the game piqued the girls' interests in world geography and history. They became familiar with places they'd never heard of before. Some cities, such as Oslo, sounded unfamiliar to my youngest daughter, but when she made the association with New York, London, and Paris, she began to realize that these were real places." For ages 9 and above. (\$35–\$40, *World*; \$40–\$45, *USA*; 64K Apple, C 64/128, 128K IBM PC. Broderbund [see address and phone number, left].)

This selection of best sellers covers much ground. Whether your family members need to hone math skills, prepare for the SAT, or master DOS, there are good programs for everyone. And judging from the reports of the people interviewed here, the best sellers in educational software are more than popular—they produce good results.

EDITOR'S NOTE: In compiling our list of best-selling educational software, we consulted the following lists: Softsel's Hot List; Computer Shop-talk's Pop Charts; Soft Kat's The Kat's Meow; and Egghead's Egg-Headliners. We also spoke to L.F. Garlinghouse Company, which publishes The Garlinghouse Family Guide to Educational Software. ■

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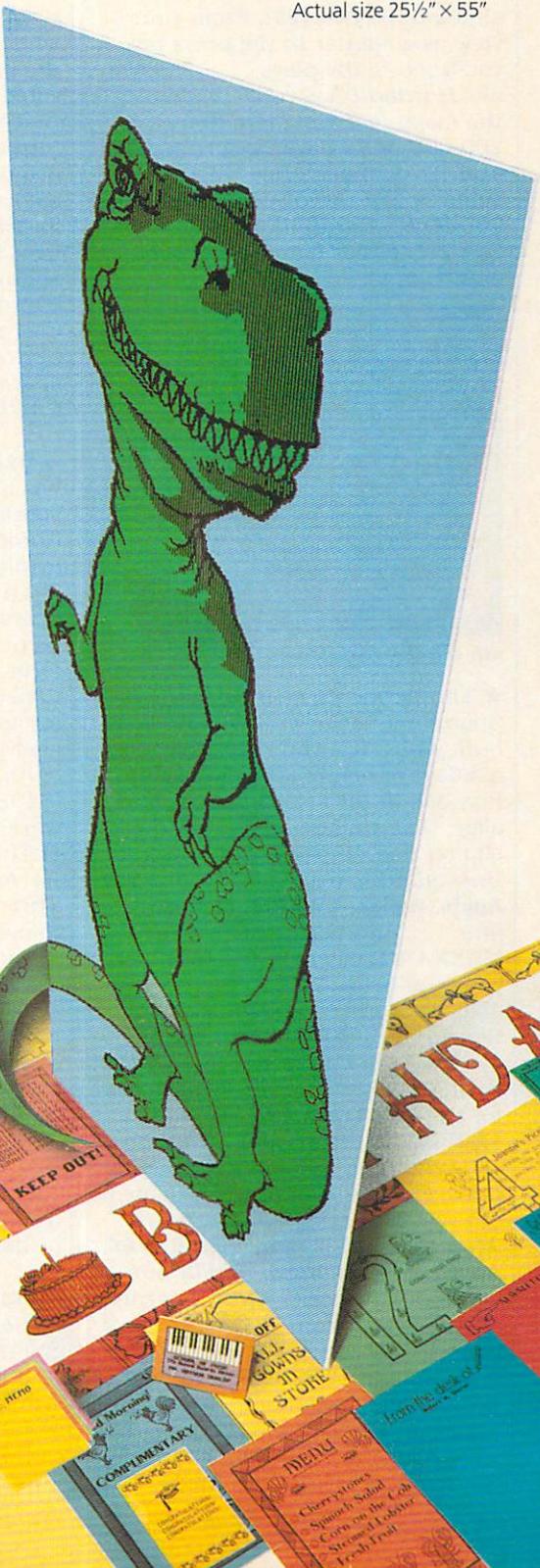
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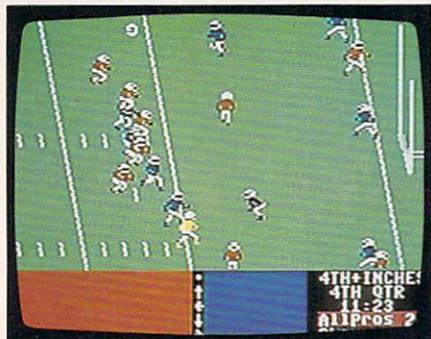
CIRCLE READER SERVICE 23

ENTERTAINMENT

HINTS, NEWS, AND NEW GAME FORMATS

NEWS AND RUMORS

★ Grab your seat cushions and pennants because **Accolade** is taking you to the football field with *4th & Inches*, a \$30 action-packed football simulation (**C 64/128**). From your view as a spotter in the press box, you'll see all the plays. . . . It looks like *Hardball* has really made it to the major leagues: More than 200,000 units have already been sold. To commemorate the landmark achievement, Accolade presented the 200,000th *Hardball* package to the San Francisco Giants' Outfielder Joel Youngblood.



4th & Inches (Accolade)

★ The second game in **Epyx**'s Street Sports line is *Street Sports Basketball*, which lets you relive the good old days of neighborhood basketball. Play ball in the school yard or back alley: Go for a fast break, but don't slip on that oil patch! *Street Sports Basketball* is ready now for the **64K Apple**, **Amiga**, **C 64/128**, or **IBM PC** for \$40. . . . Another new Epyx line, MAXX-OUT, caters to the young or young-at-heart. Five games are available, each priced at \$25. *Rad Warrior* transports you to the year 2500 A.D. and puts you in charge of saving the human race. It's available for the **64K Apple**, **C 64/128**, and **128K IBM PC**. Mine your own path as you search for diamonds in *Boulder Dash Construction Kit*. The game is out now for the **64K Apple**, **Atari**, **Atari ST**, **C 64/128**, and **128K IBM PC**.

Arctic Antics: Spy vs. Spy III pits you against the elements of nature as you fight for survival on an iceberg. It's for the **64K Apple**, **Atari**, **Atari ST**, and **128K IBM PC**. In *Spiderbot*, you make your way through a jungle and assemble a creature that will prevent a chemical meltdown. *Spiderbot* is for the **64K Apple**, **C 64/**

128, and **128K IBM PC**. In *Coil Cop (C 64/128)*, the future of toys rests in your hands as the last good toy in a factory gone haywire.

★ **Sir-tech** has been barraged with clamorings from *Wizardry* players who can't wait to get their hands on the promised fourth installment. Devoted players will be glad to know that Sir-tech has released *The Return of Werdna* and that the game is dedicated to and specifically designed for *Wizardry* experts. It's \$60 for the **64K Apple**. . . . Two other new Sir-tech titles hitting the shelves are *The Seven Spirits of Ra*, based on an ancient Egyptian myth, for the **IBM PC** (\$50), and *Deep Space: Operation Copernicus*, a space war game in **64K Apple**, **C 64/128**, and **IBM PC** formats (\$40).

★ **Gamestar**, a division of **Activision**, has a new contender in its line of sports-simulation software. *Star Rank Boxing II* picks up where *Star Rank Boxing* left off. *Star Rank Boxing II* boasts improved boxing, more characterization, new graphic elements, and a reworked joystick interface, all to let you cross, jab, and uppercut, do fancy footwork, and go for some body shots. It's on software shelves now for the **128K Apple** (\$40), **C 64/128** (\$30), and **IBM PC** (\$40). . . . Activision has signed software publisher **Microllusions**, creator of *The Faery Tale Adventure*, to its Affiliated Publishers program. Three new **Amiga** titles in one-to-one arcade style are to be introduced on the Microllusions/Activision label. They are *Fire Power*, a tank battle game; *Turbo*, an auto racing game; and *Galactic Invasion*, a space shoot-'em-up adventure. Each is priced at \$25. Two more **Amiga** titles on the Microllusions/Activision label are *Land of Legends* (\$50), an adventure with a dungeon theme, and *Black Jack Academy* (\$40), a computer rendition of "21" at its best.

★ Warm up for the World Cup with *Superstar Soccer* (from **Mandscape**'s SportTime line) for the **C 64/128** (\$35) and **IBM PC** (\$40) and planned for the **128K Apple**. . . . Also from Mandscape and designer **Chris Gray** is *Infiltrator II*. The game combines three land-based graphic adventures



Superstar Soccer (Mandscape)

with a realistic combat helicopter simulation. It's \$35 for the **64K Apple**, **C 64/128**, and **128K IBM PC**.

—LISA WU

GAME HINTS

BUREAUCRACY (Infocom). This text adventure will have you cutting your way through masses of bureaucratic red tape as you try to get to Paris for an employee-training seminar. (Amiga, 128K Apple, Atari ST, C 128, 512K Macintosh, and 128K IBM PC)

★ After filling out the license form in the beginning, save the game. This will save you time and trouble.

★ Keep an eye on your blood pressure while playing. It goes up whenever something annoying happens and comes down only with time. When your blood pressure reaches the 240/140–250/150 range, you're dead!

★ Llama food may come in handy later.

★ To get into the fortress, listen to the message on the intercom. Go back to the llama's house, then go into the farmhouse. When the weirdo walks in, tell him the secret message. He'll give you another message. Use this message to get into the fortress.

★ You can't operate the power saw while on the generator, but ask yourself: "Who can?"

★ Remember to keep track of the order in which you find the little postal service stickers.

★ The stamp collector probably

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ENTERTAINMENT

would be interested in a very rare, valuable, and blurry stamp.

★ A political macaw probably would be excited by a politician.

★ Ringing the doorbell distracts the old lady. Think about what you can do during that time.

★ The software clerk is interested in your adventure cartridge.

★ Having some trouble getting your ticket? Read the letter in the package.

★ Having difficulty making a withdrawal? Try making a negative deposit.

★ Notice that all the signs in the airport except one say "Air Zalagasa"?

★ The pillar takes you up in the world.

★ If the music is unbearable, unplug the speakers.

★ When dealing with Zalagasan stew, push the light button and then look for the seat in front of the angry man.

★ When the attendant offers service, ask for a parachute. Ask for it by the name that appears on the small laminated card.

★ Opportunity knocks once, as do people whose straps are caught in emergency hatches.

★ You don't need your parachute when you're in the tree.

★ The handles on the locker door turn in pairs.

★ Before you hack into the computer, put out a plane request.

★ The file DVH2.HAK will destroy any computer on which it runs.

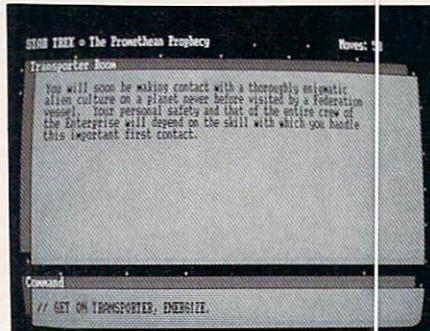
★ You can copy files onto other files.

★ After returning home, check your mail.

—KIRAN KEDLAYA
Wheaton, Maryland

STAR TREK: THE PROMETHEAN PROPHECY

PROPHECY (Simon & Schuster). While exploring an unmapped sector of space, the USS *Enterprise* was attacked. The damage caused coolants



Star Trek: The Promethean Prophecy (Simon & Schuster)

to leak and contaminate the ship's entire stock of protein food substance. As Captain Kirk, you beam down with your chief officers to the planet Prometheus Four to explore and look for a protein source. Dr. McCoy spots a mysterious humanoid. Your officers begin to speculate about the mythological Jumpers, whose eyes shine like pools of quicksilver. It is said that once you see your reflection in a Jumper's eyes, the Jumper can always see through your eyes, always know what you're doing. (64K Apple, C 64/128, 128K IBM PC)

★ Weelomin dreams of a place that is very different from his home. Give him an object that depicts another scene.

★ To reach the building across the shadowy expanse in the abandoned enclave of the Defenders, you'll need to place something on top of the quicksand. Bring your phaser into the barracks, and you will find what you need.

★ To climb down to the ledge at the Northern Promontory, you need a knotted strand and a forked object.

★ Be sure to ask everyone you meet about the Prophecy, the Afflictor, and anything else mentioned. You'll be told something different about each topic.

★ Don't forget to pick up the spheres that you find; they can be used in trading.

★ Before you go to the place that the Fool tells you about, make sure your phaser is set on wide beam.

★ The big plastic bowl is your ride into the enclave of the Sustainers—if you know how to hide yourself in it.

★ Don't overload your phaser by the rocksides; you'll hurt yourself. Do it inside the cave. You'll get what is lying underneath.

★ Spinning the gray jewel for Daia will earn you a blue gem.

★ The spinning of each gem produces a distinctive humming sound related to the enclave's color. Remember that when you think about the gray rod from the rocky landscape.

★ To enter into the Blue Gate of the Chanters, you'll need to join the procession. When you reach the Blue Gate, do as the Chanters do. You'll need robes: Look for them in the Traders' enclave. Certain objects can be traded for these robes.

★ When you see a sandstorm approaching, rush to the nearest gate, or you'll be engulfed by the storm. The Prometheans there will give you shelter until the storm passes. You may also hide in the cave.

—SCOTT SCHWARTZ
East Brunswick, New Jersey

CONVERSATIONS

Legacy of the Ancients (Electronic Arts). Now available for 64K Apple. Already out for C 64/128. Reviewed in October 1987 issue.

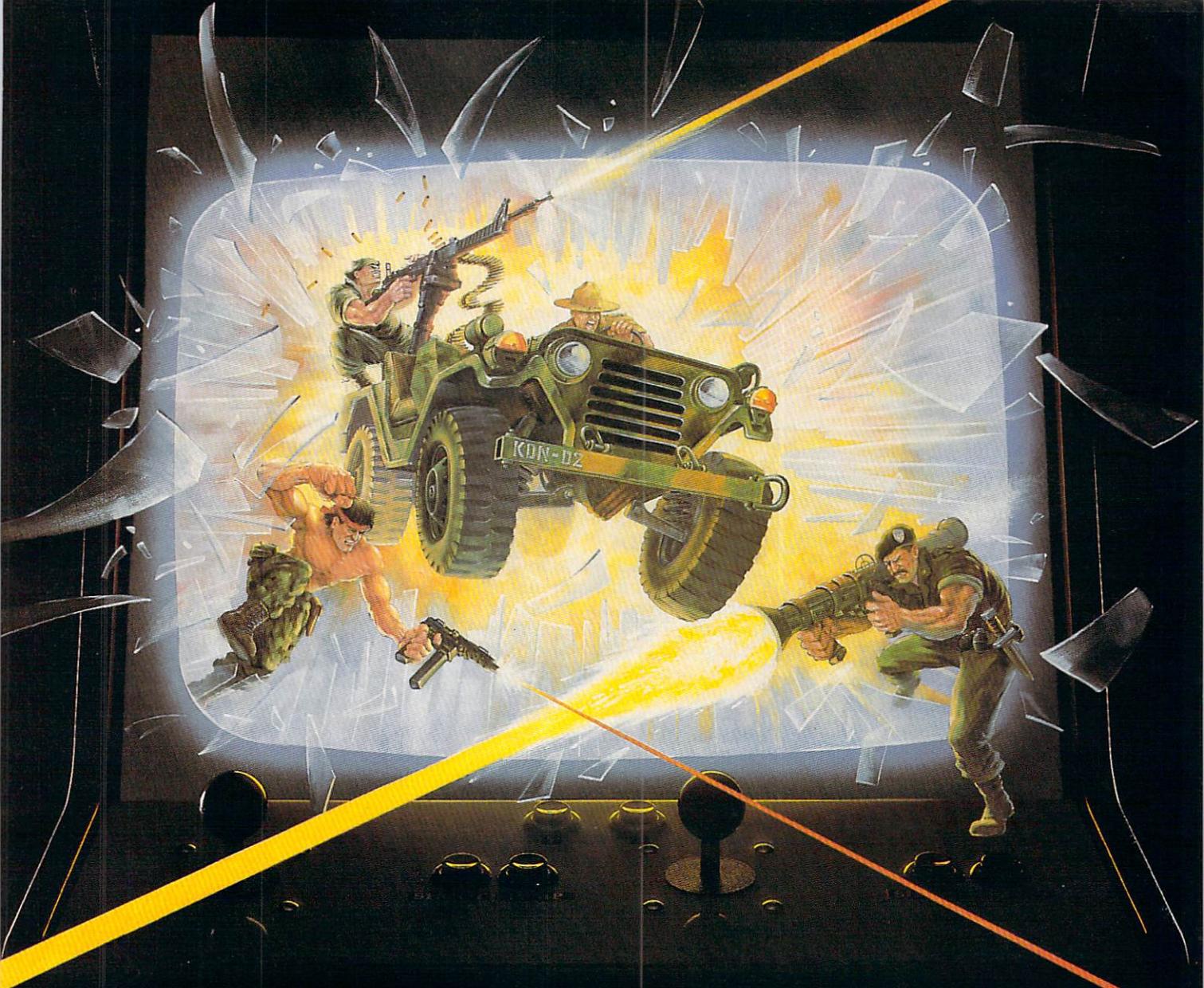
Patten vs. Rommel (Electronic Arts). Now available for IBM PC. Already out for 512K Macintosh. Reviewed in July 1987 issue.

Chuck Yeager's Advanced Flight Trainer (Electronic Arts). Now available for C 64/128. Already out for IBM PC. Reviewed in November 1987 issue. (See interview with Chuck Yeager on page 40.)

Space Quest (Sierra On-Line). Now available for 128K Apple and Apple IIgs. Already out for Amiga, Atari ST, IBM PC, and 512K Macintosh. Reviewed in August 1987 issue.

California Games (Epyx). Now available for Apple IIgs. Already out for 64K Apple, C 64/128, and IBM PC. Reviewed in January 1988 issue.

EDITOR'S NOTE: Titles listed for the IBM PC will also run on many IBM compatibles. Owing to the proliferation of compatibles, check with the publisher of the program or your dealer for compatibility. ■



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MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, AND RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

APPLE II

Let's talk about a popular but frequently misunderstood topic—memory expansion. The standard minimum RAM for an Apple II (except the gs) is 64K. In general, 64K is the maximum amount of RAM because it's the most memory that an 8-bit microprocessor can address at one time. So how can Apple sell 128K IIc's and IIe's?

Bank Switching. The answer is a software technique called "bank switching," which moves 16K chunks of memory in and out of the main 64K block. The additional 64K of RAM in a IIc or an expanded IIe follows a standard bank-switching pattern that software authors can follow to "enable" the extra memory. Bank switching operates so quickly that it imposes a slight speed penalty on program operation, a minor trade-off for the extra memory.

But many programs are not written to take advantage of bank switching when memory exceeds 128K. *AppleWorks*, *VIP Professional*, *SuperCalc*, *MultiScribe*, *WordPerfect*, *Catalyst*, *pfs:File*, and a few other programs are among the small number that do. (Almost every manufacturer of memory expansions provides a "patch" or software modification to allow at least *AppleWorks* to utilize the extra memory.) So how can you take advantage of the memory beyond 128K, if you're using a card such as Applied Engineering's RamWorks?

The answer is that you may not be able to take advantage of the extra memory, unfortunately. If the software you are using doesn't use bank switching and can't be modified to do so, then the best that you can do is to use the expansion as a RAM disk to speed up program operation through fast but temporary data storage. If your application won't benefit from a RAM disk—and many don't—you are locked out.

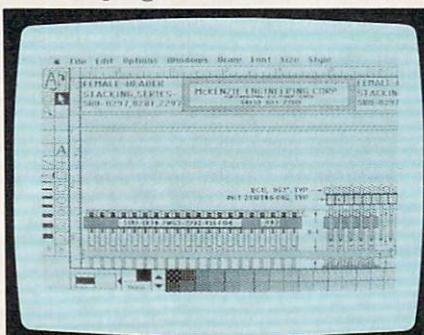
Extra K. Alternatively, consider

Beagle Bros' *Extra K* program. This nifty utility may enable you to run two 64K segments in your computer, essentially running two programs simultaneously. This is very useful for people who regularly alternate between two programs (don't try this with *AppleWorks*; if you do, you'll wind up with a dinky 34K desktop that's too small for anything serious).

MACINTOSH

Silicon Beach Software turns out some of the most amazing software for the Macintosh. The latest Silicon software I've been working with is *SuperPaint* (\$150). *SuperPaint*, one of the most powerful graphics programs for the Mac besides *Adobe Illustrator*, is a must for anyone who likes to work with graphics, especially if he or she has access to a LaserWriter.

SuperPaint is both a bit-mapped paint program and an object-oriented draw program. And it can edit



The draw layer of *SuperPaint*.

a bit-mapped picture at the full 300 dots-per-inch (dpi) resolution of the LaserWriter!

The program supports multiple windows; uses and creates files for *MacPaint*, *MacDraw*, and start-up screens; transfers items from paint to draw and vice versa; has variable magnification; and affords the user complete control over line widths, patterns, and colors. *SuperPaint* would be my first choice for a general purpose Mac graphics program.

CHARLES H. GAJEWAY can be reached on CompuServe (ID: 73357.3577) or on GENie (ID: C GAJEWAY).

ATARI

BY JOHN J. ANDERSON

I recently saw *pc-ditto* (Avant-Garde Systems; \$90) on the Atari ST. It's a software emulator that allows you to run a range of MS-DOS software on your Atari ST. In the 3.5-inch format, it can run IBM software direct from disk. Optionally, you can use a 5.25-inch drive to transfer and run compatible software.

At first I was as skeptical of *pc-ditto* as I had been, justifiably, of Magic Sac, the Macintosh emulator. But after seeing *pc-ditto* at work, I'm now a believer.

New XE Drives. The Atari XF551, a new double-speed, double-density 5.25-inch drive, has been announced for the Atari XEs. The new drive, which stores 360K, is compatible with previous Atari media formats. Atari says that the XF551 is nearly three times as fast as the old model 1050. When released, the drive will sport the brand-new Atari operating system, ADOS.

Atari and Unix? What's happened to Atari's 16-bit workstation? Remember that one? Atari's vice president of software development, Leonard Tramiel, says that a 16-bit graphics workstation is in a "fairly advanced stage of development." It will be compatible with the ST but much more powerful and will run the UNIX operating system. We've heard the prototype is impressive.

Games Are Hot. "Game" is not a four-letter word, at least not at Atari. The XE Video Game System (\$149) should do well, given the strong sales of regular video game machines. The XE Video Game System comes with a detached keyboard and runs *AtariWriter Plus*, the improved word-processing disk for 8-bit machines.

Menu-Driven Dinner. FTL's *Micro Cookbook* (Atari ST; \$50) has more than 150 recipes and a complete cooking database program that can search and retrieve recipes by such descriptions as ingredient and food category.

The program, expected out this spring, provides suggestions for leftovers or new entrees, and you can add your own recipes. Features include menu planning, portion sizing, calorie control, and automatic preparation of shopping lists.

JOHN J. ANDERSON can be reached on CompuServe (ID: 76703,654).

COMMODORE

BY SHAY ADDAMS

The latest C 64 software for desktop publishing—*Personal Newsletter*—is a good deal at \$50, considering its ability to wrap text around graphics. That means you can paste in a story written with the built-in word processor and then use a mouse or joystick to draw a box to hold your graphic. The text rejustifies quickly and smoothly around the border. You can set up multiple columns on a page up to 8½-by-11 inches.

Because *Personal Newsletter* (Softsync) lets you prepare only one page at a time, it's best suited for one-page jobs such as brochures (a program similar to *geoPublish* is recommended for multiple-page jobs).

Graph-in-a-Box. To put a picture in the box, you punch an icon. The graphics on your disk flip through the box one by one until the desired illustration appears; this illustration can then be cropped for a better fit. In addition to the more than 200 pieces of clip art provided, you can import pictures from *The Print Shop* and *geoPaint*.

Personal Newsletter runs under GEOS, and Softsync plans to take advantage of all the fonts and future upgrades to the system. The program is compatible with a range of dot-matrix printers, as well as the Hewlett Packard LaserJet.

Amiga Arcade Game. The best arcade game I've played in years is on the Amiga—*Fire Power*, a tank and helicopter shoot-'em-up. You can play against the computer or take on a friend. A modem option even lets you battle over the phone lines. Great sound effects and precision scrolling graphics make *Fire Power* (Microllusions; \$25) as exciting as anything in the real arcades.

Amiga owners who prefer tactical-combat strategy games should look at *Breach* (Omnitrend; \$40), which

puts you in charge of a team of space marines. As squad leader, your character attributes can only be improved as you complete each of the nine stand-alone scenarios. Digitized, stereo sound effects and a sleek interface make this one of the best tactical games of all time—on any computer. (It may eventually be converted for the 64.)

C 64 Red-Light Alert. Nama, co-host of QuantumLink's Astrology Club, reported a problem that apparently is common among those who regularly keep their 64s running for hours at a time. When she turned on the computer and disk drive, the drive's red light stayed on for 20 minutes instead of flipping off immediately. During this period, the 64 wouldn't do anything at all. When the light went off, Nama had to turn the 64 off and back on again to make it work.

Commodore's spokesperson, Jim Gracely, diagnosed this problem as a faulty power supply. It seems the drive light stays on until the computer has enough power to initialize the drive. Since everything worked fine after the 20-minute warm-up, there was no indication of a problem with the drive or computer. Solution: Buy a third-party power supply. One good unit for the C 64 is the CPS-10 (Computerease; \$30). Micro R & D also sells two power units, the Suntron (\$30) and the Microline (\$60).

SHAY ADDAMS, editor and publisher of *Questbusters*, an adventure-game newsletter, can be reached on CompuServe (ID: 72267,601) or on QuantumLink (ID: JBCHALMER).



BY HENRY BEECHHOLD

If you've ever had a computer disaster such as a power failure or keyboard lockup in the middle of a project, you'll appreciate *Bookmark* (Intellisoft International; \$100). It's a memory-resident program that periodically (at preselected time intervals) stashes everything related to your present operation, including the video image, safely onto your hard disk. Within a few moments of post-crash booting up, you can recover the whole bowl of chili and pick up where you left off, the only

possible loss being material that was written between a *Bookmark* SAVE and the crash. *Bookmark* is compatible with Personal System/2 models as well as older IBM PCs and clones.

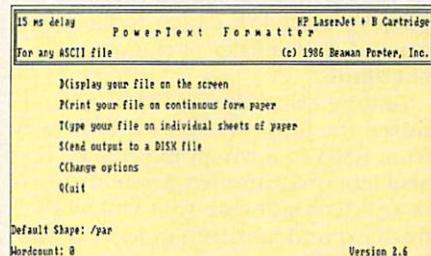
Back-It. Saving current work is important, but what about all the other stuff on your hard disk? (See "Buyer's Guide to Hard-Disk Drives" in this and next month's issues.)

Could you easily recover all the contents of your hard disk if the hard-disk monster struck? *Mace Utilities* and similar programs might do the job—though, in most cases, not without considerable effort.

On the other hand, you can use *Back-It* (Version 3.0), a program that will quickly back up your entire disk to floppies (3.5-inch or 5.25-inch) and hard drives, then back up every change. Among the speediest and most cooperative backup programs around, *Back-It* (Gazelle Systems; \$130) will, among other functions, automatically format and verify the backup floppies.

The program, which can fill a 5.25-inch floppy in about 18 seconds, uses an error-correction routine that virtually guarantees clean data even from a damaged disk.

Make That Laser Shine. There's been an update to one of my favorite programs: *PowerText Formatter* (Version 2.7), a laser printer formatting program. With almost any word processor and a Hewlett Packard or compatible laser printer (and many popular dot-matrix models), this product allows you to create professional-looking documents. The learning curve is short.



PowerText Formatter (Beaman Porter; \$150) creates pages formatted according to your own designs by following special commands typed into the original document. What you see is not what you get. That is, you must plan the layout and enter the appropriate commands. Eight style sheets come with the software, and you can create your own from these. Once you've laid out a docu-

MACHINE SPECIFICS

ment this way, you'll probably find, as I did, that visual page design (WYSIWYG) is much slower and often results in poorly designed work.

This upgrade adds kerning, dropped caps, new drawing and shading commands, and other professional design capabilities, as well as a menu-driven font manager for choosing and downloading fonts.

HENRY BEECHHOLD is the author of *The Brady Guide to Microcomputer Troubleshooting & Maintenance* (Brady Books, Prentice Hall Press, New York).

MS-DOS

BY STEVE MORGENSTERN

The size of application programs keeps expanding, especially as we move into graphics-oriented user interfaces such as Microsoft Windows. The number of really useful memory-resident programs keeps growing, too, and each eats away at the 640K limitation imposed by MS-DOS.

That's why the recent announcement of a new standard for expanded memory, supported by most of the major software and hardware suppliers and usable with most MS-DOS computers, is so important to the continuing viability of MS-DOS.

Until now there were two separate and confusing standards for expanding memory. Lotus, Intel, and Microsoft were on one side with their EMS (Expanded Memory Specification) system. On the other side, AST Research had EEMS (Enhanced Expanded Memory Specification). Now the two opposing camps have shaken hands and agreed on the new EMS Version 4.0, which is far more capable than either of the old standards.

Among other things, EMS 4.0 raises the limit of expanded memory from 8MB to a whopping 32MB. It also lets programmers write memory-resident software that will work from expanded memory, leaving the lower 640K free for regular programs and data. In addition, it offers improved multitasking capabilities.

Graphic MS-DOS Games. Lately I've seen a host of MS-DOS games featuring excellent graphics. A few highlights: *Marble Madness* (Electronic Arts), *Defender of the Crown* (Master Designer/Mindscape), *The Ancient Art of War at Sea* (Broderbund), and *Pinball Wizard* (Accolade). The latter plays fast and

smooth, includes an easy-to-use construction kit for designing your own table and, best of all, lets you "whack" the machine (watch out for the "tilt," though).

STEVE MORGENSTERN can be reached on CompuServe (ID: 72545,606).

TANDY

BY STEPHEN MILLER

Now that Tandy officially has adopted the 3.5-inch disk format, what can users do with all that software in 5.25-inch format? Unlike another major manufacturer, Tandy builds machines that support both disk formats without conversion kits. During this period of transition from one standard to another, a machine with both disk drives is indeed versatile.

You can add an external 3.5-inch drive to the 1000 EX or an internal 3.5-inch drive to the 1000 SX. You can connect an external 5.25-inch drive to the 1000 HX, which comes with a 3.5-inch drive. And you can add an internal 5.25-inch drive to the 1000 TX, which comes with a 3.5-inch drive. In fact, the 5.25-inch drive is the same one used on the older SX (cat. #25-1063, \$170).

Installing 3.5-Inch Drives. Tandy recommends that dealers install the internal drive on the TX (for about \$30). But installing the second drive is not as tough as you might think; old stone fingers here did it in 10 minutes, despite the shoddy documentation. For example, the instructions state, "Do not twist the [ribbon] cable." Well, if you follow that advice, you won't be able to plug the cable into the disk drive! The matching connection on the disk drive lines up opposite the way stated in the installation instructions. I suggest that before you even put the second drive in its slot, you take the rubber band off the ribbon cable and gently turn over the cable. There's enough slack in the cable so that it won't be pinched.

You're also going to have to insert the power supply plug by touch. The TX's internal design makes it impossible to actually see the connector with the drive plugged in.

No DiskCopy. If you do have mixed disk drives, be aware that you cannot use the DOS DISKCOPY command. You will get a "DRIVE TYPE OR DISKETTE TYPES NOT COMPATIBLE" error message.

You can, however, use the COPY command to duplicate individual files.

STEPHEN MILLER is a computer consultant and journalist.

ORPHANS

BY PATRICK SPERA

With Nintendo and Atari sparking sales of video game machines, there has been an accompanying resurgence of interest in older machines. In other words, people are pulling them out of their attics. Most retail outlets have stopped carrying a large selection of the cartridges used by these machines, but there are still dealers who carry cartridges for various consoles. One dealer who sells cartridges for Atari, Coleco, and Intellivision video game machines is Pleasant Valley Video (Dept. F, 8141 Pleasant Valley Rd., Camden, OH 45311; [513] 787-4707, BBS [513] 787-3777). Send a self-addressed, stamped envelope for its listings.

Timex Public Domain. The Greater Cleveland Timex Sinclair Users' Group (GCTSUG, Algis Gedris, 355 Royal Oak Blvd., Richmond Heights, OH 44143) wishes to swap public-domain programs with other users' groups. Its library currently has more than 2,000 programs. The programs are contained on 36 tapes, which are available to users' group libraries on the condition that these users' groups share their programs with the GCTSUG.

PATRICK SPERA is sysop of the Computer Club Forum on CompuServe (GO CLUB), a meeting place for owners of orphaned computers. He can be reached at (ID: 76703,4350).

PHONE NUMBERS

Aldus (206) 628-2352
Apple Computer, Inc. (408) 996-1010
Applied Engineering (214) 241-6060
Atari Corp. (408) 745-2000
Avant-Garde Systems (904) 221-2904
Beagle Bros. (619) 296-6400
Beaman Porter (914) 835-3156
Commodore (215) 431-9100
Computerease (618) 344-7912
FTL (619) 453-5711
Gazelle Systems (801) 377-1288
Greater Cleveland Timex Sinclair Users' Group (216) 692-6269
IBM (800) 447-4700
Intellisoft International (415) 883-1188
Microllusions (818) 360-3715
Micro R & D (303) 658-1473
Omnitrend (203) 658-6917
Pleasant Valley Video (513) 787-4707
Q-Link (703) 448-8700
Silicon Beach Software (619) 695-6956
Softsync (212) 685-2080
Tandy (817) 390-3011

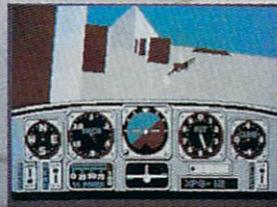
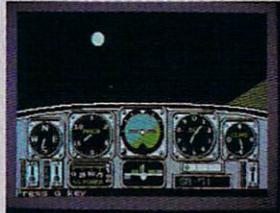
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-NY Times (Aug. 25, 1987)

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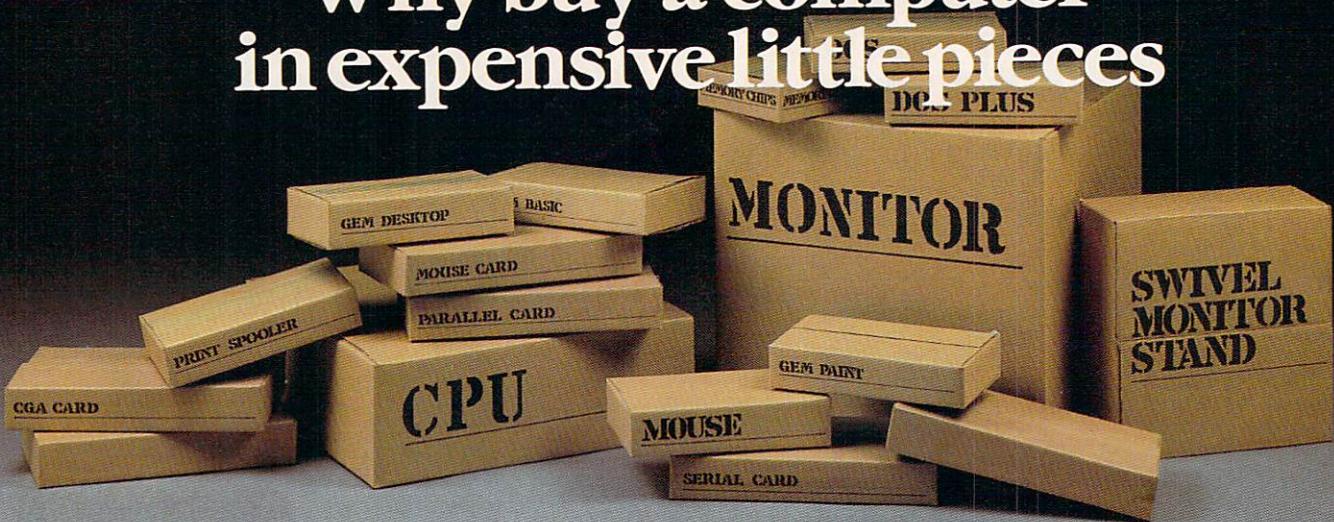
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HOW TO ORDER: Visit your retailer or call 800-245-4525 for direct VISA or MasterCard orders (in CA call 800-562-1112). The direct order price is \$39.95 for the IBM version and \$34.95 for the C64 version. Send a U.S. check or money order to Electronic Arts Direct Sales, P.O. Box 7530, San Mateo, CA 94403. Add \$3 for shipping and handling (\$5 Canadian). Please allow 1-2 weeks for U.S. delivery. Coming for the Apple II. IBM is a registered trademark of International Business Machines, Inc. C64 is a registered trademark of Commodore Electronics Limited. Software © 1987 Ned Lerner.



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Accounting Software

KEEPING BOOKS
THE
OLD-FASHIONED WAY?
AUTOMATION CAN
SAVE YOU TIME

BY LIS FLEMING

If you spend an hour a day keeping books or write around 50 expense checks each month, bookkeepers say you're probably a good candidate for automating your records. The beauty of automated bookkeeping is that you don't have to record the same entry in two or more places—the computer will do it for you. Furthermore, the computer will tabulate for you as well as print records, forecasts, and even bills. The larger your business, the more time you'll save.

But will accounting software solve your bookkeeping problems? "No way," say Norman and Barbara Eide, partners in Bottomline Concerns, a record-keeping company in Sacramento, California. If you automate a manual system that has problems, what you get is the same set of problems with a bigger price tag. Home-based bookkeepers and Big Eight accounting firms agree on this point. First, solve bookkeeping problems and have your manual system in good working order. Only then should you consider automating your books.

Don't rely on accounting software to teach you how to keep books; you'll get into hot water the first time you

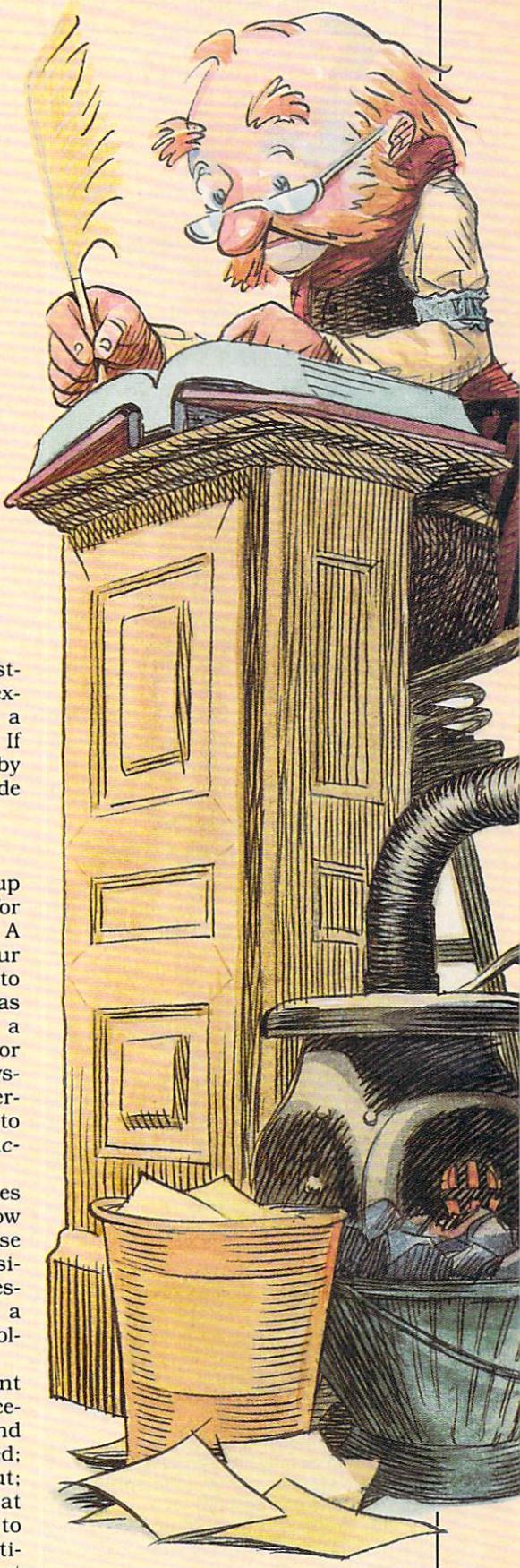
run into a problem. For instance, listing sales tax you collect as an expense rather than as a liability is a common error made by beginners. If you don't know the basics, begin by taking a class or by hiring outside consultants.

PREPARING TO AUTOMATE

An accountant can help you set up the chart of accounts best suited for your business and tax situation. A bookkeeper can help you set up your day-to-day records. You may want to begin with manual systems, such as the Dome bookkeeping ledger or a one-write check-writing system. For those already working with such systems, switching to computerized versions may be the easiest route to automation (see "Entry Level Accounting Software").

If your paper-handling procedures are in disarray, draw up a paper-flow chart with the help of everyone else involved in this part of your business. Find out where papers are presently being routed, and decide on a single procedure for everyone to follow.

Assign temporary and permanent storage places for invoices; list procedures about when, where, how, and by whom invoices will be recorded; decide how invoices will be filled out; determine who will see to it that checks are recorded; and continue to trace the paper flow to its final destinations. Then follow through: Test



the new system, evaluate how well it works, make adjustments, and be sure everyone follows the established paper-handling system.

Once you have your manual system working well and know the basics about accounting software, you can move into the planning stages of automating. If you're in a one- or two-person business with time to spare, you can probably proceed to automate on your own, following the "10 Steps to Automating" (see related section).

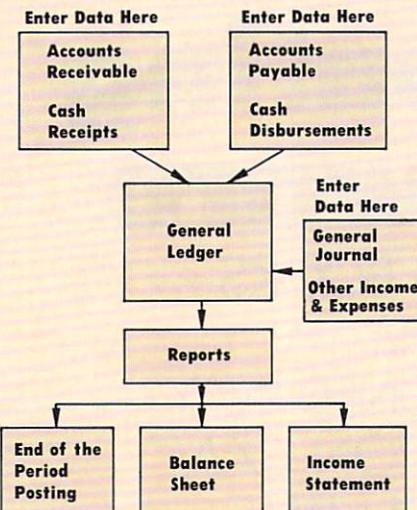
If you're running an active, demanding, growing business, the help of competent accounting/computer consultants can make the difference between an orderly transition and an incredible nightmare. Consultants tell horror stories about what can happen when you don't know what you're doing. There are businesspeople who get hopelessly behind trying to do current and back-entry computer work at the same time. There are businesses that buy and then have to discard thousands of dollars worth of hardware and software bought before they assessed their accounting needs.

To avoid nightmares and save both time and money, seek help from the experts. They will analyze your work flow, paper flow, manual systems, ac-

10 STEPS TO AUTOMATING

1. Know the fundamentals of accounting and day-to-day administrative procedures, and know how to use your computer.
2. Consult an accountant to design an overall system and a bookkeeper to set up a day-to-day system for your books.
3. Get your manual system working efficiently before you automate.
4. Choose accounting software with a strong general ledger core, and buy only those peripheral modules necessary for your business—but make sure additional modules you may need in the future are available.
5. Be sure your hardware will allow easy use of the accounting program, and leave room for growth.
6. Learn to use the accounting software.
7. Set up your new computer files, with the help of an expert if need be.
8. Set aside a period of several months to convert from manual to automated record keeping, organizing your office procedures to take advantage of time-saving features.
9. When converting data from an existing manual or computerized system, run the two systems side by side until the new one is fully established.
10. Keep it simple; don't become overwhelmed by unnecessary bells and whistles.

CORE ACCOUNTING SYSTEM INFORMATION FLOW



counting needs, and other business functions that could be automated. With that analysis, they can determine the hardware and software necessary for those business functions where automation makes sense.

CORE ACCOUNTING MODULES

Knowing the basics about record keeping helps you evaluate which accounting software is right for you. For basic accounting, there's no point buying more than you need.

In accounting software, the essential structures are called "modules." The basic accounting module is the General Ledger, which is enough for many small businesses, according to Sidney Burns, a principal in the CPA firm of Burns & Millington in Silver Spring, Maryland. Virtually all accounting software publishers have additional core modules available, such as Accounts Receivable, Accounts Payable, and Payroll.

For each module, the main advantage of using a computer is that data can be automatically sorted (by date, payee, and payer, for example), tabulated, and printed in report or invoice form.

Following are brief descriptions of how the major modules operate.

Accounts Receivable (AR). This tracks the money your customers owe you. Enter here all the data you want to keep about your sales and customers, including the dates of sales, prices, names, items or services sold, dates due, deposit numbers, dates paid, and important marketing information.

The AR module automatically journalizes all information into a cash receipts journal where data will be sorted by date, balanced, and printed

out for your monthly or quarterly end-of-the-period report. The module can prepare invoices to send to customers on preprinted, pin-fed forms. It also can age accounts. This means it can show accounts in columns according to dates when payments are due, alerting you to act on collections.

Accounts Payable (AP). This tracks money you owe suppliers for the goods and services needed to run your everyday business, including goods to be resold. Enter your purchase invoice information here, including dates purchased, prices, vendors, types of goods, dates due, payment check numbers, and dates paid.

The AP module automatically journalizes all information to the cash disbursements journal, where data is sorted by date, balanced, and printed out for your end-of-the-period report. The module can sort bills into batches according to time. This allows you to pay bills twice a month or weekly instead of daily. This feature can be a real time-saver if your business is organized to take advantage of it. The module also can write preprinted, pin-fed checks.

General Journal (GJ). The General Journal records all money transactions that don't fit into the above cash journals. An example is interest earned on savings. The General Journal is part of the General Ledger (see below) and generally not a separate module. Enter all necessary data for miscellaneous income or expenses, including dates, dollar amounts, payer, payee, and memo. The GJ automatically posts information by date into the General Ledger for end-of-the-period reporting and balancing.

General Ledger (GL). This represents your complete set of books. Some computerized accounting systems allow data entry into the General Ledger, and some don't. If you can enter data into the GL, you can obviously make changes—and also mistakes—more easily, so such a system is recommended for professionals only.

In either case, information automatically flows into the General Ledger from the other modules (Accounts Receivable and Accounts Payable, for instance). In some cases, the General Ledger has cash disbursements and cash receipts sections, which can be used in lieu of Accounts Payable and Accounts Receivable.

The General Ledger module automatically records, journalizes, and computes balances for all transac-

tions entered in the basic modules. It posts and prints end-of-the-period reports by date with check numbers, invoice numbers, amounts, dates received, dates due, and balances. The printed report gives you an at-a-glance view of the entire monthly or quarterly period. The General Ledger module also prints out various other reports, including the income statement (assets, liabilities) and the balance sheet (income, expenses). These reports allow you to see how your business performs every period.

ENTRY-LEVEL ACCOUNTING SOFTWARE

ACCPAC Easy
Computer Associates
(408) 432-1727
\$89 per module
320K IBM PC
Support: \$50-\$75 per year

Two modules, general accounting and payroll, can run together or alone. Classic debit/credit journal-entry format. General accounting includes general ledger, accounts payable, accounts receivable. Has a flexible chart of accounts, automatic check writing, and other journals and registers. Compatible with ACCPAC Plus, a higher-level accounting package.

Back to Basics
Peachtree Software
(404) 564-5700
\$199
128K Apple, IBM PC, Macintosh
Support: \$1 per minute (\$20 minimum per call)

Prints out 42 report forms based on entry of income and expenses. Includes accounts payable, accounts receivable, and general ledger.

DAC-Easy Accounting
DAC Software, Inc.
(214) 458-0038
\$100
IBM PC, Atari ST, 128K Apple
Support: First 10 minutes free for 60 days; \$60 per hour after that.

Modules include accounts receivable, accounts payable, general ledger, inventory, and purchase order modules. Also prints bills and allows forecasts. Has help screens. Tutorial on disk is optional.

Dome Simplified Bookkeeping System
Great American Software
(603) 889-5410
\$40
64K Apple, C 64/128, IBM PC
Support: Free

A computerized version of the Dome bookkeeping system, which tracks income and expenses plus produces payroll and financial reports.

Financial Navigator
MoneyCare, Inc.
(415) 962-0333
\$99 personal version 1.2; \$399 professional version 2.1

PERIPHERAL ACCOUNTING MODULES

The great majority of all businesses need only the core accounting modules. But others have specific needs that can be met with peripheral (add-on) modules that can be purchased either separately or with integrated packages. Knowing whether these add-on modules are available for the program you choose helps you keep an eye on future growth. Buy only what you need now, but get a package that allows you to add compatible

modules in the future. Here are some peripheral modules to consider.

Inventory. This module keeps track of merchandise and is useful for anyone storing products or supplies. Data entry here can be tremendously complex and time consuming. It involves daily input of information such as items, amounts, sizes, colors, wholesale prices, retail prices, delivery dates, suppliers, numbers sold, numbers in stock, and invoice numbers.

The main use of the inventory module is to keep track of merchandise by letting you see what is on order, what is now in stock, and what has been sold. It can alert you when stock gets low and tell you when and how much to reorder. It can also alert you to the supplier price changes that affect markup of your resale prices.

There are expensive programs that come with wands that read price tag codes, as well as with specialized cash registers hooked up to computers. Get advice from a computer consultant specializing in inventory before deciding to computerize.

Payroll. This module tracks employee wage records. You enter all data required for employees, such as names, Social Security numbers, amounts earned, tips, insurance, benefits, and deductions.

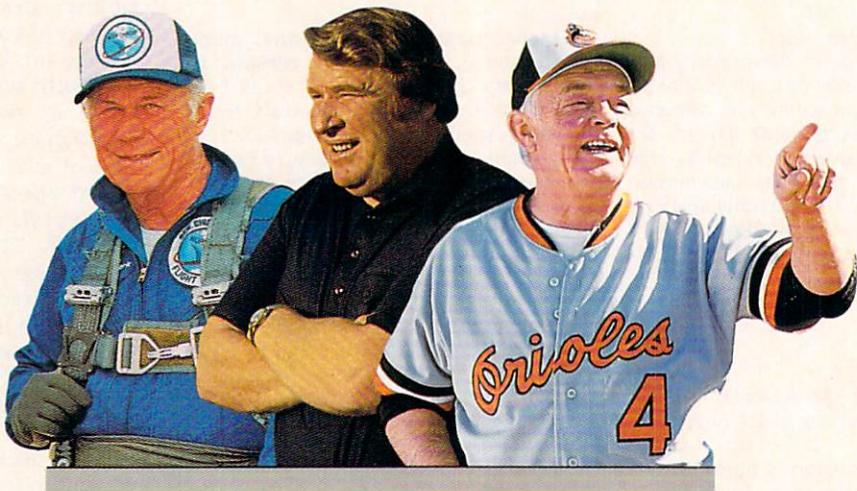
The module writes preprinted pinned payroll checks, including a detachable itemized record of wages and deductions. It also automatically posts information to the general ledger for end-of-the-period reports. There are payroll modules that will automatically compute tips according to the latest FICA regulations.

Consider the following advice from experts about using the payroll module. If you have 5 or fewer employees, it's faster to handle payroll checks manually. If you have from 5 to 15 employees, it may be worthwhile to use a payroll module. If you have more than 15 employees, look into using a commercial payroll service. Some are priced as low as \$1 a month per employee. A good service could save you a lot of time and money. Also, make sure the model you choose incorporates your particular state's laws and regulations.

KNOW-HOW

Old-fashioned know-how is the secret to successfully automating your accounting system. Know accounting; know your computer; know your manual system; know your software—and know when and whom to call for help. ■

Chuck Yeager, John Madden, Earl Weaver



THREE EXPERTS DESIGN PROGRAMS THAT BRING NEW LIFE AND REALISM TO COMPUTERS

BY NICK SULLIVAN

Weaver, Madden, Yeager. Baseball, football, flying. Household words. TV personalities. Experts. Competitors. Winners. But game designers? Yes, all three. Just listen to them.

EARL WEAVER. "If they're gonna put my name on it, I want it to work," says Earl Weaver, co-designer of Electronic Arts's *Earl Weaver Baseball*, a baseball game that really takes you out to the ballpark. The first time the former manager of the Baltimore Orioles touched a mouse, he picked it up and started waving it at the screen,

as if it were a wand. But manual dexterity is not what made Earl Weaver famous; winning enough games to finish in first or second place 21 out of the 29 years he managed is his legacy. "I hate to lose," says the future Hall of Famer whose .583 winning percentage is fourth among big-league managers.

JOHN MADDEN. "I wanted to do a game that was realistic, as close to the game of football as possible," says John Madden, co-designer of *John Madden Football*. "I've been in football all my life, and my credibility is wrapped up in it." Madden was head coach of the Oakland Raiders for 10

years and won more than 100 games and a Super Bowl championship. And as a CBS football commentator, he has a hawk's view of the patterns formed when 22 men skirmish: what looks right, what looks good, what works. "I presented the game of football, and [Electronic Arts] made a game out of it," says the man whose hand-scratched, post-play analysis on TV is swifter and more insightful than any computer's.

CHUCK YEAGER. "The first flight simulator I know of was used in '43. This one's about a million times better than that," says Chuck Yeager, co-designer of *Chuck Yeager's Ad-*

To design *Earl Weaver Baseball*, Weaver told software designer Eddie Dombrower (left) everything he knows about the game of baseball. (See review, below.)

vanced Flight Trainer, the simulator that puts you in the seat of a Bell X-1 and other mach-breaking planes. The first time Yeager sat in front of a "tabletop computer," he thought it was prehistoric. "Every time I fly a plane, I use a computer," says the man who broke the sound barrier (Mach 1) in October 1947, has 15,000 flying hours, and still flies F-18s before breakfast at Edwards Air Force Base near Los Angeles.

Weaver, Madden, Yeager. Who needs artificial intelligence when you've got human computers?

WINNING FORMULA

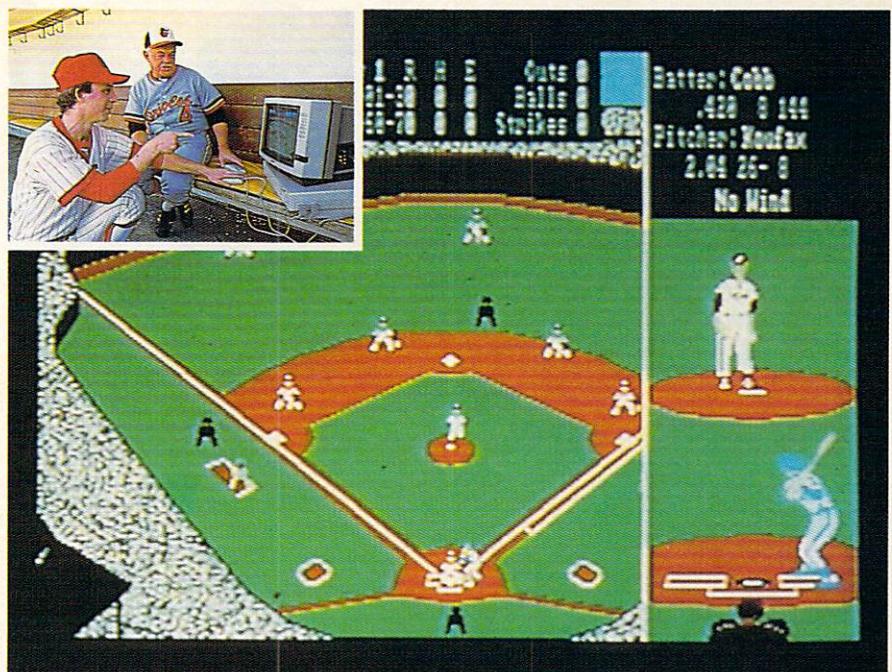
"I believe in heroes," says Trip Hawkins, president of Electronic Arts, the company that introduced the three experts to programmers and is publishing their games.

"A story is something that happens to characters you care about. Films set the stage, get you involved with a character. We've tried to do the same thing. Beyond that, Weaver, Yeager, and Madden give the products a sense of realism."

Electronic Arts has used experts as designers before, for instance in *Dr. J. and Larry Bird Go One-on-One*. Hawkins enjoyed that experience and found basketball star Julius Erving "larger than life." He also saw the realism their involvement lent to the final product.

Using experts is a boon for product development. Getting big names is a boon for marketing. Electronic Arts sold more than 100,000 copies of the Yeager title in its first three months, in the MS-DOS format only. "Not only is it our best MS-DOS title ever, it's the fastest-selling product of any kind we've ever had," says Karen Janowski, director of EA's marketing-entertainment division. (Apple and C 64/128 versions are now available.) Dealers use Chuck Yeager cardboard stand-ups to attract customers. The power of the Yeager name is awesome: 35 to 40 percent of *Chuck Yeager's* buyers already own flight simulator programs, says Janowski.

The Weaver title gained popularity more slowly, since it was released first in Amiga format and sold to a smaller owner base. Now that the game has been converted to MS-DOS format, Janowski expects sales to have reached 50,000 by the beginning of 1988. Baseball fans are crazy about Weaver: To date, about 50 per-



cent of the *Earl Weaver* buyers already own a baseball program.

The Madden title will be released in the spring, in Apple format first. Amiga, Atari ST, and C 64/128 versions will follow.

Each of the three experts had very similar design experiences, which says that Electronic Arts either picked its experts well or has devised a predictable formula for product development. Each expert started on a lark, not quite sure what would be expected of him. As it became clear that real work would be required, and as they began to see results from the programmers, they became more involved. Now, each feels that he has contributed to a product that is realistic, that bears his individual stamp, and that people will enjoy. Each is proud to see his name on the software package.

WEAVER

Weaver, for instance, originally became interested "because it was prof-

REVIEW: EARL WEAVER BASEBALL

HARDWARE REQUIREMENTS: Amiga, IBM PC
PUBLISHER: Electronic Arts
PRICE: \$50

The only thing missing in *Earl Weaver Baseball* is the hot dogs. With its unprecedented graphics, sound, and smooth play system alone, this would be a great game. But the addition of extremely detailed player statistics and manager options makes this the best baseball simulation to date.

Play is conducted with a split-screen view, one of the whole field, and the other centering on the pitcher and batter. Pitching and batting are straightforward, although hitting a 95-mph heater requires

itable; but after I saw the potential, the object was to get it right." He ended up traveling from his home in Florida to California three or four times to meet with husband-and-wife software designers Eddie Dombrower and Teri Mason.

One afternoon they went to an empty baseball stadium. "They fired questions at me for four or five hours, asking what I'd do in a given situation, and I'd respond quickly, 'Swing away,' or 'Play the infield in.'" In the computer game, this information turns up when you ASK EARL for his advice as you manage. And at the ballpark, Mason used a tape recorder to capture crowd and bat-cracking sounds that you hear when you play the game.

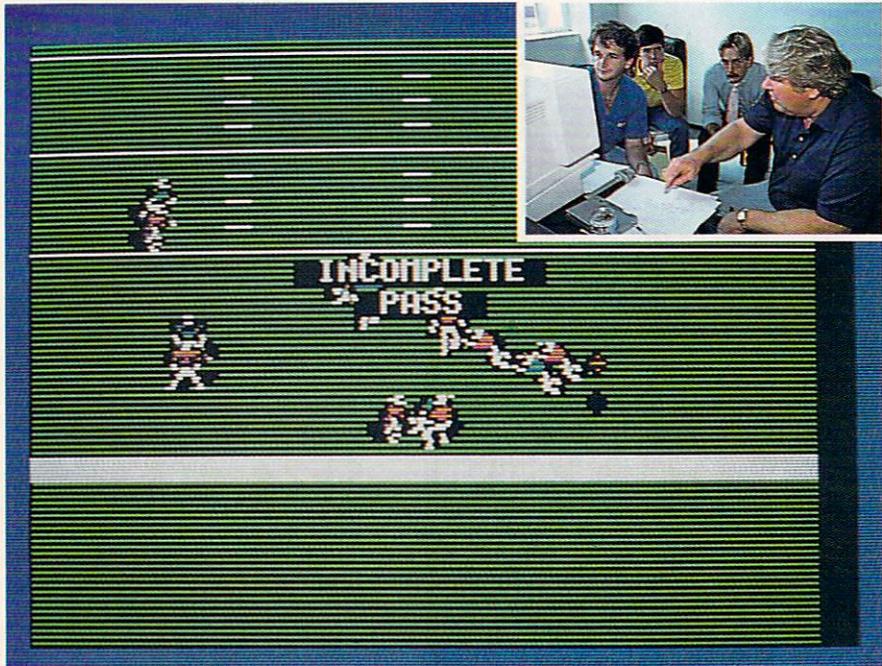
"Another time I sat down with Dombrower, and he said, 'Tell me the perfect lineup.' So I went through the whole thing: someone with speed who can get on [base], someone who can hit behind the runner, then the power, then start with speed again in

quick reflexes. . . .

Earl Weaver Baseball doesn't stop at just letting you play and manage actual games. It also allows you to be the General Manager or even the Commissioner. As the General Manager, you may trade, draft, and create players, while as the Commissioner, you can create new leagues and teams or simply grant everybody the day off. Those with a sense of history will appreciate the option that automatically updates player statistics after every game.

—DAVID LANDENDOEN

This is an excerpt of a review that appeared in the October 1987 issue of FAMILY & HOME-OFFICE COMPUTING.



Madden, right, and Electronic Arts
are currently working on a football
program that will be available
initially for the Apple.

the plays, how you called them; when you needed the special teams; whether the pass and blocking patterns worked and were realistic; whether there were illegal formations."

Even more important, Madden gave Electronic Arts access to old Oakland Raiders playbooks. The program now boasts a 243-play playbook. For most people, this will be the first time they see the depth and complexity of NFL plays. Madden also defined three to five "pet plays" for each team in the NFL. "Most of the stuff is from the Raiders, no particular year, but some stuff is newer, like the two tight ends the Redskins use."

The football part of the game comes from Madden's experience as a coach; the game part, the look and feel, comes from his "commentator side," he says. "How I look at football controlled the game," he says. The polishing touches that have been added make it a true Madden product. For instance, each player has 12 ratings that affect his physical movement (speed, acceleration, tackling, and so forth), so that when the players are in motion, play will replicate a TV broadcast, though the graphics are obviously inferior. Some players perform better on artificial surfaces or in certain weather conditions.

And when the defense blitzes a quarterback, a "sack pressure" warning sound goes off to make the player feel the "emotion of danger." You can almost hear Madden saying on TV, "How would you like to have 1,000 pounds of pure beef drop on you?" Says Madden, "I told programmer Robin Antonick about it; I don't know if they can make it real. It's the same fear a receiver in the end zone feels when five guys converge on him."

Finally, Madden didn't like the way the passes looked on-screen. "Whether guys were drilling it 60 yards or 10 yards, it looked the same. We tried to put some arc on the ball for longer passes and some 'touch' on the ball for shorter passes."

"It's been a lot of work; it's taken up a lot more time than I thought it would," says Madden. "It's one of those things, you know, it's not like it's been done before and people could say, 'We've been doing this for 35 years, and first we do this, then this, and then it's a wrap.' There were a lot of unknowns, and we had to keep going back and looking at it

the sixth spot, or the seventh spot in the National League. All that got programmed in, don't ask me how." Now, after you pick your lineup, you can ASK EARL, and the computer will shuffle the players to match Weaver's notion of what a lineup should be.

Talking by phone one day before his daily golf game, Weaver sounded enthusiastic about his program. "See, the greatest thing is you could pick the Minnesota and St. Louis lineups and play the World Series. When [manager Tom] Kelly went out to see [pitcher Les] Straker in the sixth inning of the third game with Minnesota ahead, 1-0, the computer would have shown you he was tired. But you could have chosen to leave him in. Maybe something different would have happened." What happened is St. Louis won, 3-1.

Befitting his background, Weaver thinks the way to play the game is in MANAGE mode, rather than PLAY AND MANAGE. "Batting or pitching with the mouse or joystick, you've got to worry about manual dexterity, know what I mean? My son will beat me every time with the mouse. But when you're just managing, strategy and knowledge will win." In fact, you can choose to manage *against* Weaver, if you're feeling brave. "Kelly or Herzog might not steal when I steal. And you might not do what I do. But that's the fun of it. Putting on a squeeze with the bases loaded in the sixth inning is not a smart option, but it's an option you can take if you think one run will win the game. Whatever you do, you're at the mercy of the players."

Weaver feels that his "stamp" on

the game is the way the players move when the ball is hit. "When the ball is hit between left and center, the shortshop goes where I told him to go. It's where Mark Belanger went. The players in the game go the same places Belanger, Davey Johnson, Brooks Robinson went, when I had those great Orioles teams. The cutoffs and rundown are just like the Orioles did in spring training."

Does he play the game much? "No," says Weaver. "I made decisions for 35 years. Some of the desire is gone." Does he like the part in the game where the manager storms from the dugout and goes beak to beak with the umpire? "Yeah, that's me."

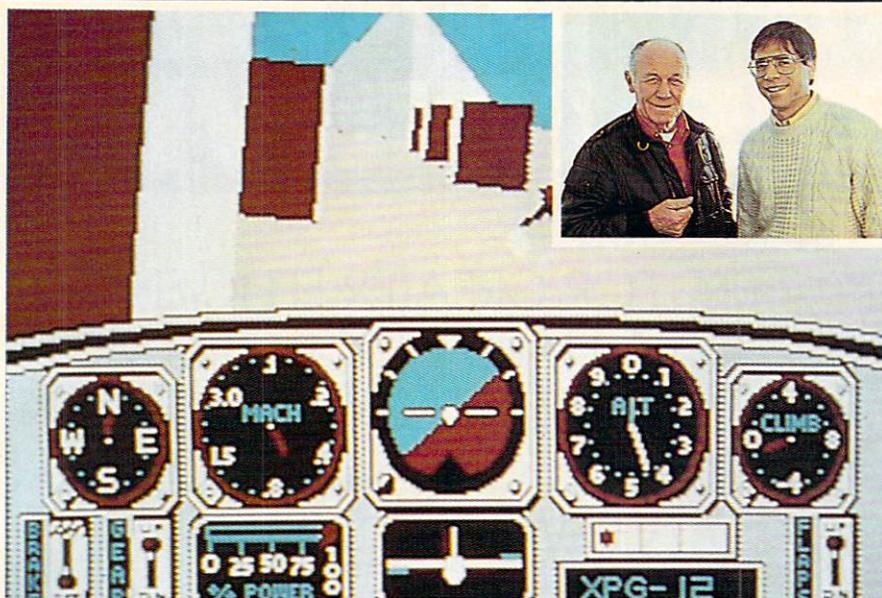
MADDEN

When Electronic Arts approached Madden, he was amazed that the company was looking for a real simulation and didn't just want his name. "But as he thought about it," says EA President Hawkins, "he realized it would be a product that players and coaches at all levels could use to develop game plans."

On a two-day train trip from Denver to Oakland, Hawkins, Madden, and others mapped out a plan for the program. Its complexity was immediately obvious; compared to baseball and flying, football is more difficult to choreograph. "Getting 22 people on the field moving right is important, like playing with a full pack of cards," says Madden, who called FAMILY & HOME-OFFICE COMPUTING on a mobile phone from a van crossing the California desert. "As we went over the game, my thing was always football:



Yeager, left, and software designer Ned Lerner spent two years designing *Chuck Yeager's Advanced Flight Trainer*. (See review, below.)



and fixing it. But I think it came out pretty good."

YEAGER

Why did Chuck Yeager, a national hero, become involved with Electronic Arts? "I'm not that busy, really. AC Delco commercials take up only five days a year. And my wife, Glennis, who handles the whole nine yards of my life, thought I should get involved so I could talk to my grandkid, who's got a tabletop computer."

Yeager spent about 10 to 15 hours a month for two years working with designer Ned Lerner ("I wanted to make a \$50,000 simulator for under \$50") to make the flying experience come alive. The first thing he did was shake up the programmers and get them to think like a test pilot thinks. "If you want to really scorch something, hell, you can program the X-31, the aerospace plane, in there," Yeager told a hushed band of programmers the first time he met them.

REVIEW: **CHUCK YEAGER'S ADVANCED FLIGHT TRAINER**

HARDWARE REQUIREMENTS: Apple, C 64/128, IBM PC
PUBLISHER: Electronic Arts
PRICE: \$35-\$40

By combining the flying skills of the still-superb *Flight Simulator II* with daring aerobatics and offering an incredible array of options, this is by far the most exciting flying simulation we've yet encountered.

You begin by deciding which of 14 planes to fly, including biplanes; light-training aircraft; World War I-, World War II-, Korean-, and Vietnam-era fighters; modern jets; and even experimental aircraft. Each plane has a different "feel" to its control yoke. Each plane's instrumentation is also unique, which allows you to

"Now, see, you got some kid who can say, 'man, this thing is smoking along at Mach 25.' Once you accelerate out to about Mach 18, you're gathering liquid oxygen, and then you've got liquid oxygen and hydrogen turned into chemical rockets, and you go into space with it. All these things, I tell you, tax your imagination."

The general was hot! He encouraged Lerner and his design team, which included a former Air Force captain, to think about the outer limits. Next, Yeager nixed the idea of scenery. "We never had much time for scenery," he told them. Instead, Yeager designed a test-pilot section for mach-speed bullets such as the Bell X-1.

Once the ground rules were set, Yeager helped select most of the 14 airplanes that you can choose to fly in the simulator. His favorite is the P-51 Mustang, which he flew in World War II. For each plane, the cockpit

learn the less difficult ones and work your way into the really hard ones. . . . The program offers you 12 views, including a phenomenally exciting "chase plane" point of view that follows your aircraft through its paces so you can see exactly what you're doing.

In short, this program is a must for anyone who enjoys flying simulations. Playtesters came back to it again and again and could only be forcibly pried away from the joystick with the promise of more hours at future dates. They rated the game highly on all levels, including its beautiful 3-D scrolling graphics, its easy-to-learn control system, its well-written tutorial, and its "feel" of flying. One of the year's best.

—JAMES DELSON

This is an excerpt of a review that appeared in the November 1987 issue of FAMILY & HOME-OFFICE COMPUTING.

controls had to be drawn on-screen, and the plane's performance was programmed in. "We programmed in limits you can't exceed. It teaches you what you can do, what to expect. For a kid, flying these planes is like playing a pinball machine."

"This simulator will teach kids about the characteristics of flying. Today, with F-16s and F-20s, computers play a big role. There are up to 20 functions on a stick. You can use a simulator to keep sharp, keep your skills intact."

Yeager is amazed at the graphic quality of the "visual cues" on the computer screen in the finished product. "The reference to horizon, resolution of the ground, and the depth perception are very impressive and were a surprise to me. I didn't think it'd be so good. It changed my perception of computers a bit."

But what the general is most proud of is the feel of the plane as you fly, the relationship between the joystick and movement on the screen. "Discerning the difference between real flying and what it looks and feels like on the screen—that was my major role. I was responsible for bridging the gap between real life and simulation."

How does that little IBM joystick compare with the real thing, the big stick in the sky? "It's the difference between \$3.95 and \$200,000," says Yeager with a big laugh. "But I think we got it about as good as you can get it—at a reasonable price."

Maybe it's the way it turned out, maybe it's the soaring sales on which he has a royalty, maybe it's his nostalgia for dogfighting—but Yeager's at it again. The only man ever to shoot down five enemy planes in one day is now collaborating with Lerner's team on a sequel with the working title *Chuck Yeager's Air Combat Simulator*.

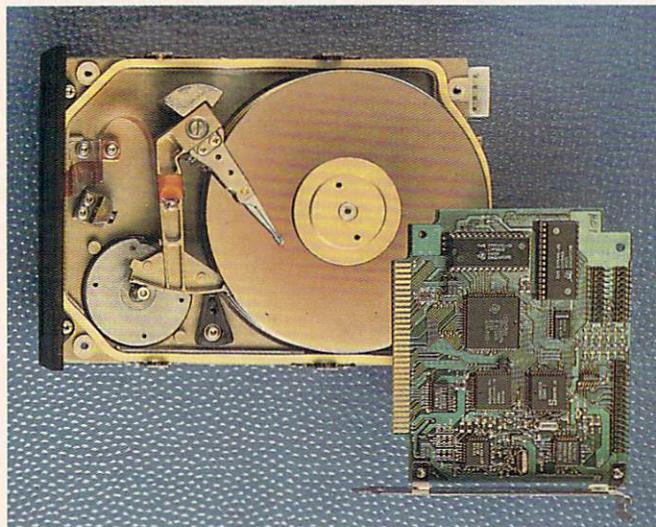
"See, the thing is, you learn how to fly these things first. The point is: Don't bust your tail! And you can't bust your tail with a simulator. Then you get up there and dogfight. Take someone on. That's what it's all about." That's the genial general.

NO GAME

Weaver, Madden, Yeager. Single-minded, determined, perfectionists. Win more, see more, fly higher. If you don't win, you lose. It's black and white. And it's not a game. ■

HARD-DISK DRIVES

BY STEVE DITLEA



Hard-disk drive and host adapter from Seagate Technology.

Loading from a hard disk, my word processor is on the screen almost as soon as I turn on my computer," boasts Gerald Lipnicki, a Montreal-based systems developer for the Canadian National Railroad, who has an IBM PC at home. "With floppy disks, it used to take 40 seconds to load *MultiMate*."

Bill Haynes, who runs an electrical contracting and residential remodeling business out of his home in San Francisco, California, found himself in the same boat and bailed out the same way—by adding an external hard-disk drive to his Macintosh Plus. His wife, a graphic designer, was frustrated by *PageMaker*'s sluggish performance with floppy disks. And he was tired of switching disks with *Microsoft Works*—which he uses for calculating account estimates, tracking crew hours and materials, and sending out estimates and invoices. "We probably save 20 seconds every time we boot up," says Haynes.

Even if you were once certain that you'd never need a hard drive for storage of thousands of pages of documents, data, and programs, you'll find the necessity of a hard drive becomes incontrovertible within months of switching from a floppy-disk system. Perhaps you have one of those feature-laden MS-DOS word processors and find loading several program disks tedious. Or maybe your Macintosh's desktop-publishing software seems to take forever to turn graphics and text into disk-stored printer files. Or if you're running a small business with an Apple II, your correspondence and financial spreadsheets may overflow dozens of easily scattered floppies.

To achieve greater efficiency, speed, and economy, the hard-disk drive is the most cost-effective addition you can make to your computer system. And if you are buying a new computer—whether your first, second, or

FOR GREATER EFFICIENCY, A HARD DISK IS THE MOST COST-EFFECTIVE ADDITION YOU CAN MAKE TO YOUR COMPUTER SYSTEM

Electrical contractor Bill Haynes uses a hard drive to run *PageMaker* and *Microsoft Works* on his Macintosh Plus.

third—it makes sense to buy one with a built-in hard drive, if you can afford it. Most MS-DOS and Macintosh computers can be bought with hard drives already installed. For the extra money you spend, you'll be paid back in spades.

ONCE LUXURY, NOW COMMODITY

Unlike a floppy disk, which you insert into and extract from the drive, a hard disk is a rigid magnetic platter that remains sealed in its enclosure. You load programs and files onto the hard disk; when it's full, you must either erase the files or remove them to floppies to make more storage space.

Once luxuries more expensive than personal computers themselves, hard drives have become commodities that are now widespread. They are fixtures in more than 70 percent of the IBM PC compatibles (costing more than \$1,000) in use now and will soon reach 80 to 85 percent on newer Macintosh systems, according to Phil Devin, a senior industry analyst with Dataquest, a research firm based in San Jose, California.

As they've declined in price, hard drives have increased in capacity and speed. When introduced for the Apple II in 1981 (by Corvus Systems, Inc.), hard drives could store 5MB. That's 5,242,880 bytes or characters—equivalent to about 2,600 pages of text. The first IBM XTs came with 10MB hard drives; with IBM PC ATs, 30MB

STEVE DITLEA, author of *Using WordStar* (Que; 1987), wrote "Buying and Selling a Used Computer," in the April 1987 issue.

became more common. Today you can buy a 230MB hard drive for the Macintosh, while the top of IBM's new PS/2 line, the Model 80, has options for up to 628MB of hard-disk storage (using two hard drives).

Hard drives are fast also, as the above testimonials attest. Hard drives can access data as much as 10 times faster than floppy drives.

A DREAM CAN TURN INTO A NIGHTMARE

For all these reasons, hard drives can be a boon when used properly. The user turns on the computer, and the chosen program automatically loads. Then the desired file is selected and quickly loaded. No floppies are needed, and the waiting time is minimal. But, with the increased amount of data stored on a hard drive, the chances of a major disaster are greater.

"Hard disks are just too vulnerable to damage," says Irv Teibel, who runs the record company Syntonic Research, Inc. out of his home in Austin, Texas. After four months of using his Macintosh Plus for accounting and correspondence, Teibel bought his first hard drive. Within a month, he experienced his first hard-drive disaster.



Record producer Irv Teibel and his daughter, Dara, who mistakenly turned off his hard drive and temporarily destroyed all his data files.

While using *PageMaker* to help his wife, Rosanne, produce a newsletter, he watched in horror as daughter, Dara, now three, switched off the drive while it was in operation. She had been attracted by the drive's power supply light. "When I powered up again," Teibel remembers, "the hard drive progressively destroyed all my files." Moral: Get a good backup system in place and working before you use your hard drive. (See next month's "How to Manage Your Hard-Disk Drive" for more on backup procedures.)

INTERNAL DRIVES

The most obvious distinction among hard drives is whether they are internal or external. The main advantage of an internal drive is that it wastes no desk space; the main disadvantage is that it draws on the computer's power and usually requires a noisy cooling fan.

MS-DOS. For MS-DOS computers, standard internal hard drives fit in the same space as that occupied by a floppy-disk drive. Part of the hard disk's faceplate can be seen where a floppy's gate would ordinarily appear. Like floppy drives, hard drives require controller circuit boards.

"Half-height" units permit insertion of two drives (hard or floppy or both) where only one "full-height" component used to fit. More recently, 3.5-inch diameter

hard drives brought the same capacity that standard-sized 5.25-inch hard drives brought to computers, where size and power consumption are critical.

Downsizing has also made a new kind of internal drive possible: the hard disk on a card. This kind of unit includes disk and controller on a circuit board that is plugged into one of a PC's expansion slots (though most such units are thick enough to take up more room than single circuit cards). These plug-in drives are more expensive than typical internal drives, but require far less power.



The Macintosh SE, which can include an internal hard drive, is shown here with the HyperDrive FX/40 from General Computer Corp.

Macintosh. On the Macintosh, an internal hard drive is completely tucked away inside the chassis. On early models, they were the only viable high-capacity storage medium because external units were painfully slow. However, because of the Mac's inclusion of a high-voltage monitor tube in its chassis, installation is hazardous if performed by the user; it's best done by a dealer or service technician. Now it's preferable to buy a Macintosh with a hard drive installed (as on the Macintosh SE) or to use an external drive.

On the "open" Macintosh II, users can install their own internal hard drives. And we can also expect to see PC-style slim "hard cards" on the market soon.

EXTERNAL HARD DRIVES

There is one main advantage to external drives: In most cases, the drive can be shipped for repairs independent of the computer—and therefore without time-consuming and difficult removal from the computer.

MS-DOS. For MS-DOS computers, external hard drives are rarities, unless they are attached to either multiuser file servers for networks or to individual models with removable media, such as the Bernoulli Box (see chart).

Apple II/Macintosh. With the exception of one discontinued model, hard drives for the Apple II have always been external units. Early Apple IIs accommodated relatively slow hard-disk controller cards until the advent of a faster interface available on a plug-in board. This high-speed connection, the Small Computer Systems Interface (SCSI), is standard on the Mac Plus and later Mac models.

External hard drives for both Apple II and Macintosh

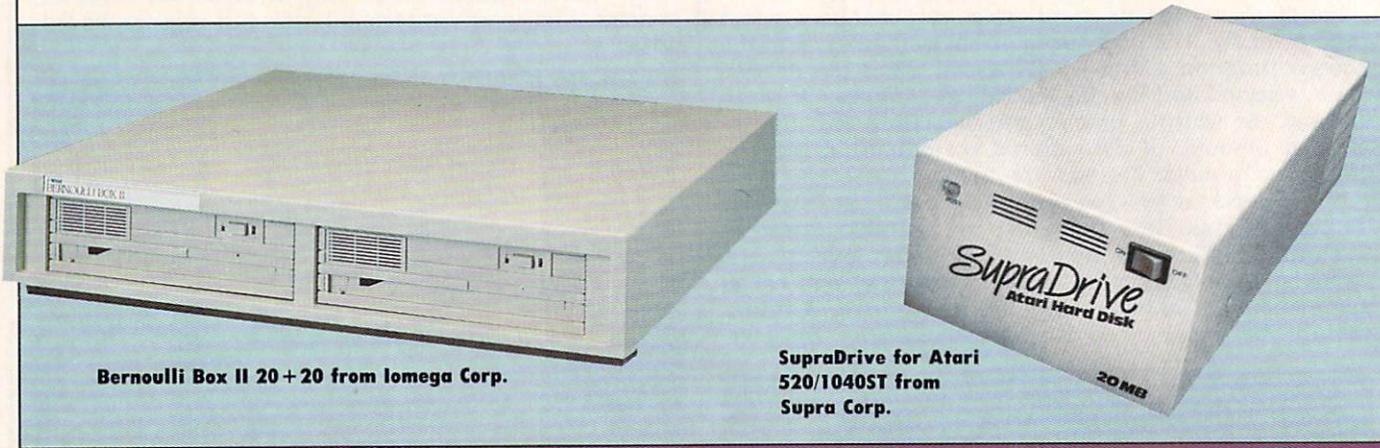
computers are available in two basic design configurations: as flat boxes meant to fit under the monitor, such as Apple's offerings, or in cubic or vertical enclosures to be placed alongside the computer.

A SHOPPER'S CHECKLIST

Once you decide whether an internal or external device makes better sense for your machine and your needs, there are a number of other items to consider.

Capacity. Massive storage is the main reason for buying a hard drive, making capacity your first consideration. There are still some 10MB hard drives being sold, but with today's more sophisticated operating systems and programs, that amount of storage will be filled easily. You should consider 20MB as the minimum for a hard drive.

You may find limits to your practical use of larger capacity hard drives because of the design of your computer's operating system. For example, MS-DOS cannot



Bernoulli Box II 20 + 20 from Iomega Corp.

SupraDrive for Atari
520/1040ST from
Supra Corp.

SHOPPER'S TEARSHEET: A SAMPLING OF HARD-DISK DRIVES FOR

Manufacturer	Model	Price ¹	Capacity (MB)	Access Speed (Milliseconds)	Configuration
IBM PC AND PC/XT COMPATIBLES					
Microscience International (408) 730-5965	HH-825	\$295	21	65	Internal half-height
Seagate Technology (408) 438-6550	ST225	\$230– \$250	21	65	Internal half-height
Tandon Corp. (805) 523-0340	TM9262AI	\$399	20	85	Internal half-height
	BusinessCard 21	\$499	21	85	1.5 slot card
Mountain Computer (408) 379-4300	DriveCard 20	\$795	22	58	1.5 slot card
	DriveCard 30	\$895	32	58	1.5 slot card
Plus Development Corp. (408) 434-6900	Hardcard 20	\$795	21	49	1 slot card
	Hardcard 40	\$1,195	42	35	1 slot card
Western Digital Corp. (714) 863-0102	FileCard 20	\$599	21	65	1.5 slot card
Iomega Corp. (801) 778-1000	Bernoulli Box 20 + 20	\$2,299	20 + 20	38	External cartridge
	Bernoulli Box II 20 + 20	\$2,350	20 + 20	40	External cartridge
	Bernoulli Drive II B120i	\$1,299	21.4	40	Internal half-height cartridge
Eastman Kodak Company (800) 445-6325, ext. 990	Vermatim 12-Megabyte Subsystem	\$898	10	75	Internal half-height cartridge
	Vermatim 12-Megabyte External Subsystem	\$1,198	10	75	External cartridge
IBM PC/AT COMPATIBLES					
Microscience International (408) 730-5965	HH-1050	\$695	44	28	Internal half-height
	HH-1075	\$895	62	28	Internal half-height
MiniScribe Corp. (303) 651-6000	M6053	N/A	44	28	Internal full-height
Rodime, Inc. (216) 765-8414	Rodime R-Card 45 ²	\$1,495	45	28	1.5-slot card
Seagate Technology (408) 438-6550	ST251	\$485	42	40	Internal half-height
	ST4038	\$580	30	40	Internal full-height
APPLE II PLUS/Ile/IIGs AND MACINTOSH PLUS/SE/II (SCSI needed for II Plus/Ile/IIGs)					
Apple Computer, Inc. (408) 996-1010	HD20SC	\$1,299	20	65–89	External
	HD40SC	\$1,999	40	30	External
CMS Enhancements, Inc. (714) 259-9555	SC20	\$795	20	85	External
	SC40	\$1,395	38.5	29	External
	SC20/A2S	\$895	20	85	External
	SC40/A2S	\$1,495	38.5	29	External
General Computer Corp. (617) 890-0880	HyperDrive FX/20	\$999	20	65	External
	HyperDrive FX/40	\$1,399	40	40	External
Iomega Corp. (801) 778-1000	Bernoulli Box 20 + 20 for the Macintosh	\$2,350	20 + 20	38	External cartridge
Jasmine Technology, Inc. (415) 621-4339	Direct Drive 20	\$649	21	65	External
	Direct Drive 40	\$999	40	40	External
MacPeak Systems Inc. (512) 328-0747	Plus-30	\$895	30	65	External
	Plus-60	\$1,195	60	30	External

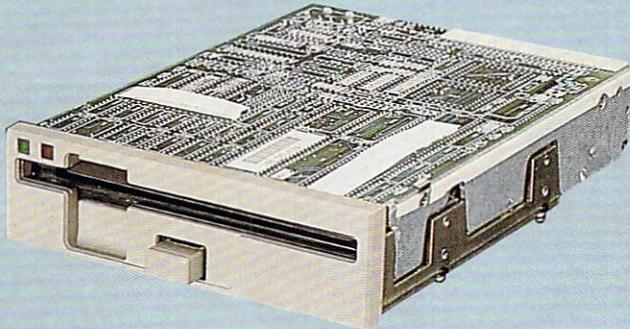
handle more than 32MB at a time; for larger amounts, a hard drive must be divided by the user into "volumes" that fall within the 32MB limit.

Access Speed. Even though all hard drives can retrieve data faster than floppy drives can, a particular rate of speed may be required by your computer's specifications. For IBM PCs and compatibles, a speed of 85 milliseconds is adequate, but 40 milliseconds or less is standard for a PC AT. Access time for Macintosh hard drives usually

falls within a range of 80 to 20 milliseconds.

Aside from technical requirements, the shorter the access time, the less you'll have to wait for such disk-intensive operations as those common in database or desktop-publishing applications.

Interface. In addition to the technology used in the hard drive itself, faster access to data is often the result of improvements in the interface connecting the drive to your computer. For instance, the original interface speci-



Verbatim 12MB internal subsystem from Eastman Kodak Company.



Mountain Computer's Hardcard 20 is a 1.5-slot hard-disk drive "on a card."

MS-DOS, APPLE II, MACINTOSH, ATARI ST, AND AMIGA COMPUTERS

Manufacturer	Model	Price	Capacity (MB)	Access Speed (Milliseconds)	Configuration
PLI (415) 657-2211	PL30	\$995	30	65	External
	PL50 Turbo	\$1,495	50	35	External
Rodime (216) 765-8414	Rodime 20 Plus	\$1,195	20	85	External
	Rodime 20I Plus	\$1,295	20	85	Internal
	Rodime 45 Plus	\$1,595	45	28	External
	Rodime 45I Plus	\$1,695	45	28	Internal
APPLE II PLUS/Ile/IIGS					
First Class Peripherals (702) 883-4000 (800) 982-3232	THE SIDER D2 ²	\$595	20	65	External
	THE SIDER D4 ²	\$795	40	65	External
MACINTOSH SE AND II					
Apple Computer Inc. (408) 996-1010	Internal 20SC	\$999	20	65-89	Internal
	Internal 40SC	\$1,599	40	30	Internal
General Computer Corp. (617) 890-0880	HyperDrive FI/40	\$1,399	40	29	Internal
	HyperDrive FI/40 ³	\$1,199	40	29	Internal
Jasmine Technologies, Inc. (415) 621-4339	InnerDrive 50 ³	\$999	51	26	Internal
PLI (415) 657-2211	PL50I	\$1,295	50	35	Internal
Rodime, Inc. (216) 765-8414	Rodime 450 RX	\$1,595	45	28	Internal
AMIGA 500/1000/2000					
C-Ltd. (316) 267-3807	AM-24 (500)	\$950	24	60	External
	AM-24 (1000)	\$995	24	60	External
	AM-24 (2000)	\$800	24	60	Internal
	AM-33 (500)	\$1,200	33	60	External
	AM-33 (1000)	\$1,250	33	60	External
	AM-33 (2000)	\$1,050	33	60	Internal
Supra Corporation (503) 967-9075	20MB SupraDrive Hard Disk	\$799	20	65	External
	30MB SupraDrive Hard Disk	\$995	30	65	External
	(2000 only)				
	20MB SupraDrive Internal Hard Disk	\$799	20	65	Internal
	30MB SupraDrive Internal Hard Disk	\$899	30	65	Internal
ATARI 520/1040ST					
Atari Corp. (408) 745-2000	SH204	\$700	20	85	External
	FA20ST	\$700	20	60	External
ICD, Inc. (815) 968-2228	FA30ST	\$950	30	60	External
Supra Corporation (503) 967-9075	20MB SupraDrive Hard Disk	\$699	20	65	External
	30MB SupraDrive Hard Disk	\$895	30	65	External

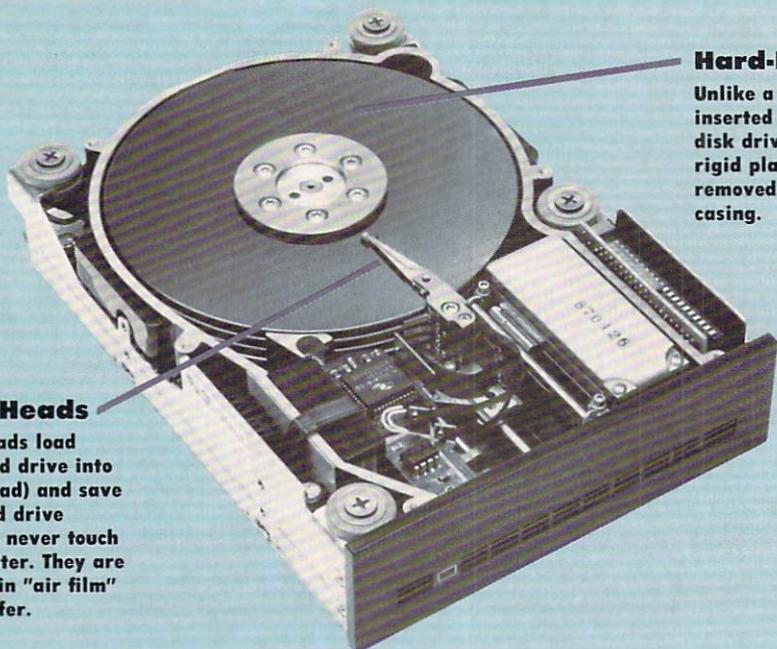
¹In many cases, hard-disk controller card/interface must be purchased separately.

²Also available for IBM PC XT and PS/2 Model 30.

³Only works on Macintosh II.

INSIDE A HARD-DISK DRIVE

Shown below is a Microscience internal hard-disk drive for MS-DOS computers. Here, the drive is shown with the casing removed. When the casing is in place, the half-height 5.25-inch drive fits in the same spot on the computer as a half-height floppy drive.



Read/Write Heads

The read/write heads load data from the hard drive into your computer (read) and save data onto the hard drive (write). The heads never touch the hard-disk platter. They are separated by a thin "air film" that acts as a buffer.

Hard-Disk Platter

Unlike a floppy disk, which is inserted and removed from the disk drive, the hard disk is a rigid platter that cannot be removed from the drive casing.

fication for IBM PC and compatibles allows for an information transfer rate of up to 5 million bits per second, while a newer standard, the Enhanced Small Device Interface (ESDI), accepts data two to three times faster. To take advantage of the newer interfaces, you may need a special controller card for your computer.

The SCSI interface has the advantage of permitting up to six hard drives to be easily interconnected.

Power Consumption. Internal hard drives draw power from the computer, generally from 5 to 50 watts. Most computers sold today can handle this power drain. But if you are using several expansion cards, a hard drive that consumes a lot of power may prove too much of a drain on your system. You may have no choice but to use a hard drive with a separate power supply or install a new power supply in your computer.

Noise Level. Today's hard drives run quietly when spinning and accessing information, but their cooling fans can sometimes be extremely loud and annoying. Before purchasing a hard drive, be sure to listen to it in operation. Because of their compact design, hard drives on circuit cards are among the quietest models available today.

Ease of Installation. Installing a hard drive consists of making the physical connection to your system and then formatting the disk. Attaching an external hard drive is not much different from attaching an external floppy-disk drive, but installing an internal drive requires steady hands, a screwdriver, and some sense of what you're doing. If in doubt, have the dealer install the drive.

Plug-in hard cards are simple to install. But occasionally, the simplest installation can be complicated, as I discovered when trying to run a Plus Development Hard-card 40. Slipping the unit into an expansion slot inside an IBM PC compatible was no problem; but I discovered that the high-capacity drive required the use of DOS 3.0

or higher, whereas my computer had always been used with an earlier version of DOS. Once the newer DOS was obtained, an updated ROM chip had to be purchased to accommodate the new operating system. Installation, which should have taken half an hour, stretched to more than two weeks while the necessary extras were ordered and delivered. However, once these were in place, formatting took only a few additional minutes.

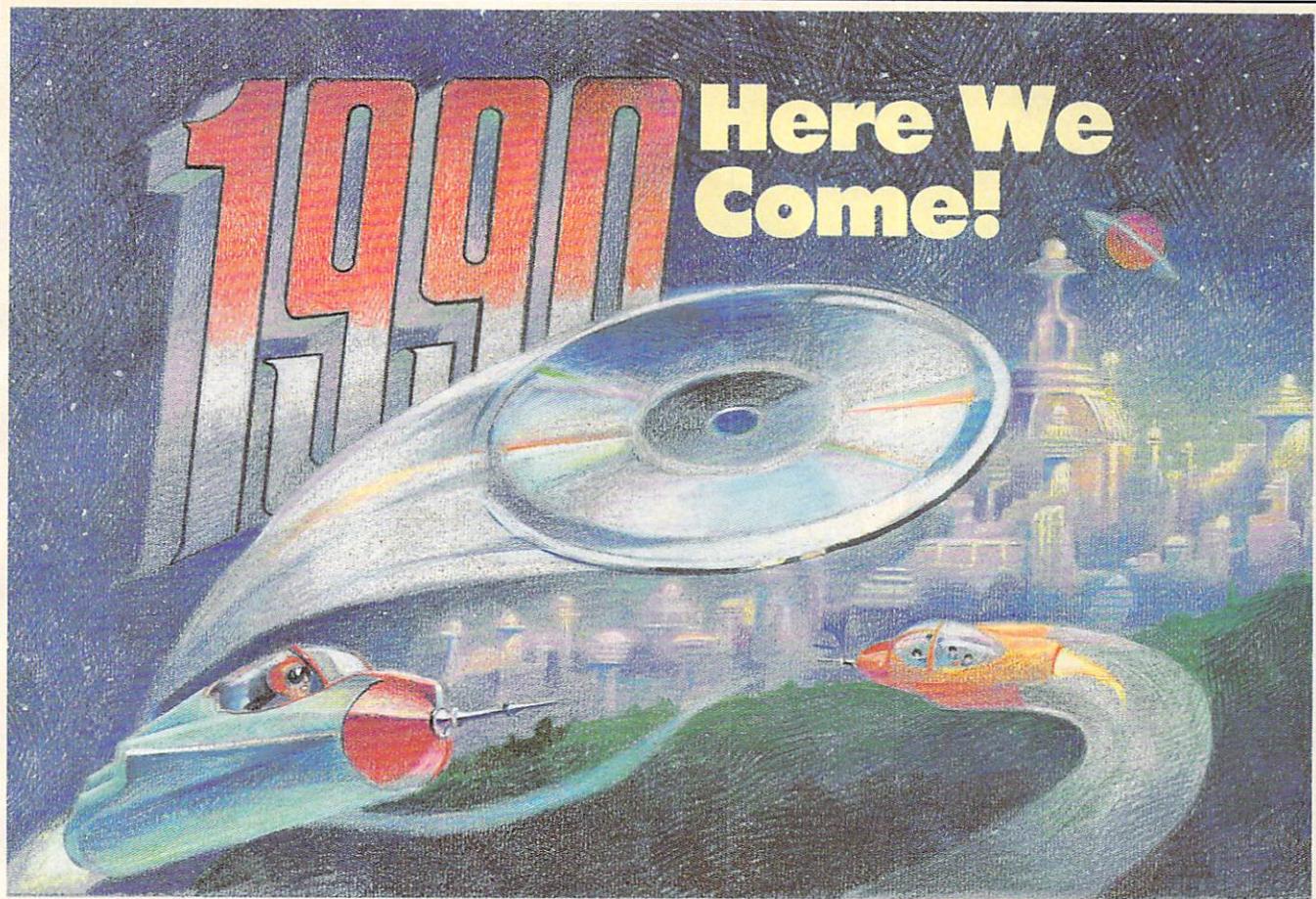
Bundled Software. Today you may find programs—bundled with hard drives—that provide diagnostics for checking possible surface damage, evaluation of a drive's speed and other characteristics, optimization of group files for faster access, compression of data onto a disk, backup to other storage media, and restoration of accidentally erased or damaged files. Any of these useful programs also can be purchased separately.

HORSE AND BUGGY BECOME CADILLAC

Irv Teibel, who lost his data when daughter Dara flicked off his hard drive, didn't lose it for good. He had made backup copies onto floppy disks and spent several days reloading them onto a reformatted hard drive. He then acquired a second hard-disk drive to use for backup. The goal of copying files from one hard drive to another has proven elusive; he's had trouble getting one drive to send files to another.

To add to the trouble, the hard drives' cooling fans are so loud that Teibel has placed them under his desk to muffle the noise. Still, for all his problems with hard drives, Teibel is not about to switch back to floppies: "It would be like driving a horse and buggy after driving a Cadillac." ■

EDITOR'S NOTE: March's "How to Manage Your Hard-Disk Drive" will carry tips on setting up subdirectories, making backups of hard-disk data, and writing batch files.



AS INTERACTIVE AUDIO-VIDEO MACHINES, COMPUTERS WILL HELP US ABSORB INFORMATION IN NEW WAYS

BY NICK SULLIVAN

Bach, Brahms, and the Beatles are driving the computer industry into new territory. As more and more compact disc (CD) recordings are bought—inspiring marketers to call audio CD the most successful consumer product of all time—more and more ways are being devised to use the discs. Combining the CD's vast storage space and multimedia ability with the computer's interactive nature is a natural—and creates a new medium that will affect our study, work, and play.

As telecommunications and computing converge, as CDs and computers are connected, fresh new streams of information will flow into our homes and offices—making rivers of text, computer graphics and animation, still and moving images, and concert-hall sound.

"Information is the strategic resource of the 1990s," contends John

Sculley, chairman and chief executive officer of Apple Computer. "New communication and information technologies not only give us new things to think about, but new facilities to think with." As the increased processing power of computers allows new ways to interpret data, creative ideas and solutions will be forged from information as if it were iron ore.

But how will we mine this information? With the ever-increasing memory and advanced processing power of new computers, how can volumes of fresh information be delivered to these ravenous machines? When volumes of information are delivered, how can they be accessed and interpreted? Will computers be able to help us find the right data, as well as interpret it?

As engineers and entrepreneurs build products to solve these problems, the computer and consumer electronics worlds will cross-fertilize—with the CD as a stabilizing bond. The end result will be an inter-

active audio-video machine that brings new realism to computer applications. "Computer pioneers had to suspend disbelief," says Trip Hawkins, president of Electronic Arts. "There was no realism. The CD changes that."

THE CD STANDARD

While no one can say exactly which CD technologies will emerge as leaders for what markets (see sections on CD-ROM, CD-I, and DVI), it's clear there will be no 8-track tape fiasco, no confusing competition as there is between 5.25-inch and 3.5-inch floppy disks, no incompatibility among the Apple, Commodore, and IBM operating systems.

The 4.72-inch CD that plays the Beatles and Springsteen is an international standard, supported by every major electronics and computer manufacturer. The CD stores at least 550MB of data—and that can include not only voice and music, but video, graphics, and text. To transmit that much data with a 1200-baud modem

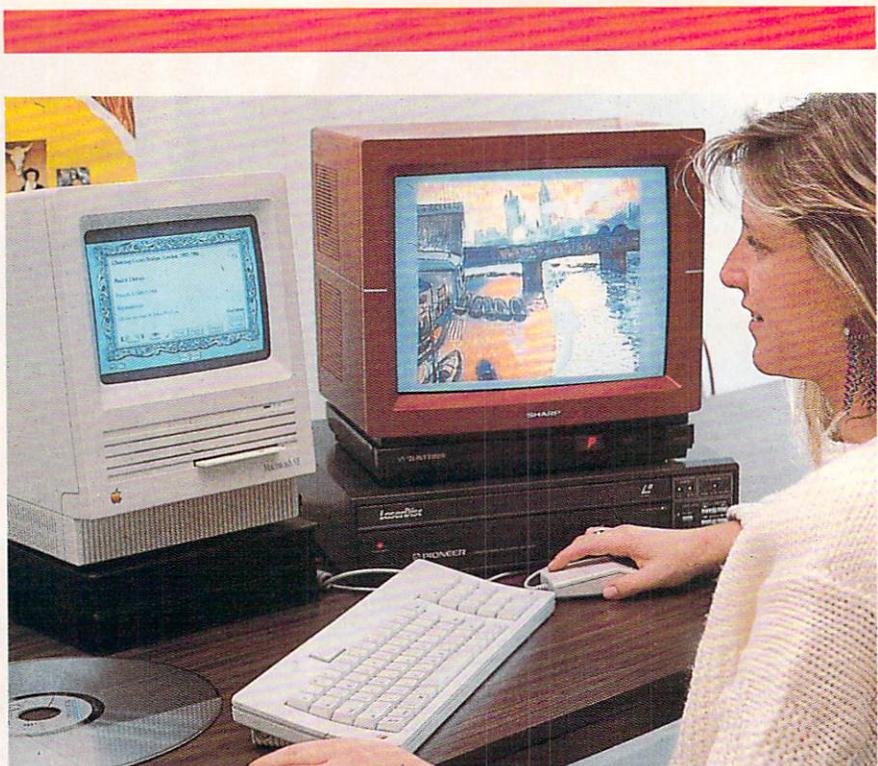
would take 53 days, according to Microsoft's book, *The New Papyrus*.

The only possible rain on the CD parade will be the emergence of digital tape. Sony recently introduced digital audiotape (DAT) in Europe, and DATs should soon emigrate to the United States. One major advantage to using DAT is that it allows you to record. However, it doesn't have either the permanence or high-speed access of CDs. At any rate, it will be some time before DAT can catch up to CDs, because the economies of scale now make production of CDs and players quite inexpensive.

If CDs (and their larger cousins, the videodiscs) are bringing more storage space and audio-video realism to computers, what are computers bringing to the table?

First—whether information comes from electronic databases or CDs—computers will provide the graphical interface between the users and the gigabytes. After all, you need to keep your bearings as you move through this sea of data, and computers are born navigators.

Second, computers bring interactivity, a chance to make intelligent choices and personalize applications. In the past, most video has been a one-way street—turning viewers into



HyperCard on the Macintosh controls The National Gallery of Art LaserGuide (The Voyager Company), a videodisc that lets you tour the museum. The videodisc, a cousin of CD-ROM, plays on a television monitor. A Laserstack is a HyperCard program that turns the still photos and motion pictures stored on the videodisc into a vast visual database waiting to be explored.

CD-ROM: A CD CONTROLLED BY A COMPUTER

A Multimedia Encyclopedia?

For the past few years, industry seers have been talking about a multimedia encyclopedia that will incorporate music, video, and text. With such a product, you could read about Beethoven and listen to a selection of his music. In a current Microsoft demo, you watch images of President John F. Kennedy flow across the screen as you listen to one of his speeches. No such encyclopedia exists, although it's technically feasible. If and when it's made, chances are it will be done with CD-ROM.

CD-ROM is a CD with data—text, pictures, sound, and video—that a computer can read. The disc is the same type used for CD audio; in fact, a CD-ROM drive is capable of playing an audio CD, although the reverse is not true.

CD-ROM drives (marketed by Sony, Panasonic, Hitatchi, Amdek, and others, beginning at \$750) can theoretically be connected to any computer. Interfaces, however, are being sold mainly for MS-DOS and Macintosh computers. The same CD-ROM disc can be read by different computers. However, to access the sights and sounds on a CD-ROM disc, the computer uses retrieval software, which differs for each operating system.

In many ways, a CD-ROM is like a huge hard disk—except that you can't write data to it. The ROM in CD-ROM stands for "read-only memory," and you can't alter it any more than you can alter your comput-

er's built-in ROM software. Even though a CD-ROM stores much more than an average hard-disk drive does, access time is even quicker. Within the year, we'll probably see computers with built-in CD-ROM drives, and it may become a standard computer peripheral.

Right now, with an estimated 10,000 to 20,000 CD-ROM drives in use, the majority of CD-ROM titles are industrial, institutional, or scientific, such as McGraw Hill's *Concise Encyclopedia of Science and Technology*. CD-ROMs are obviously valuable for storing large volumes of data that don't change often. With more than a half-billion bytes of space, you can store more data than you could on twenty-five 20MB hard-disk drives, you can access it faster, and the media is sturdier, too.

However, the recently introduced Microsoft *Bookshelf*, a collection of 10 writer's reference books on one CD, signals a new trend in development toward titles geared for professionals. *Bookshelf* is designed to be used with several leading word processors; you can leave your writing and quickly access tools such as *The Chicago Manual of Style* and *Roget's International Thesaurus*.

The other main consumer title is Grolier's *The Electronic Encyclopedia* (also called the *Academic American Encyclopedia* [AAE]), which came out more than a year ago. AAE, the same all-text product (not multimedia) available on CompuServe and Dow Jones, has not done well

because of the low number of CD-ROM drives in use. Nonetheless, Grolier chairman Robert B. Clarke says that his electronic publishing arm is "break-even" this year, thanks to AAE royalties from 15 databases. "For significant profit, the hardware has to be out there, and we have to be at retail with an encyclopedia," Clarke was quoted in *CD-I News*, a trade newsletter. Meanwhile, Grolier is forging ahead with CD-I development (see *CD-I section*).

Fred Meyer, president of Meridian Data, Inc., whose CD Publisher system has been used to create Microsoft *Bookshelf*, Lotus's *One Source*, and many other CD-ROM products, thinks that one growth area for CD-ROM will be to augment existing software. "Adventure games could be much more extensive and much more graphic with CD-ROM." Meyer also sees the development of home-shopping CD-ROMs with extensive product catalogs and courseware CD-ROMs, related to school curriculums, that people use at home. "CD-ROM will have a great impact on educators," he says.

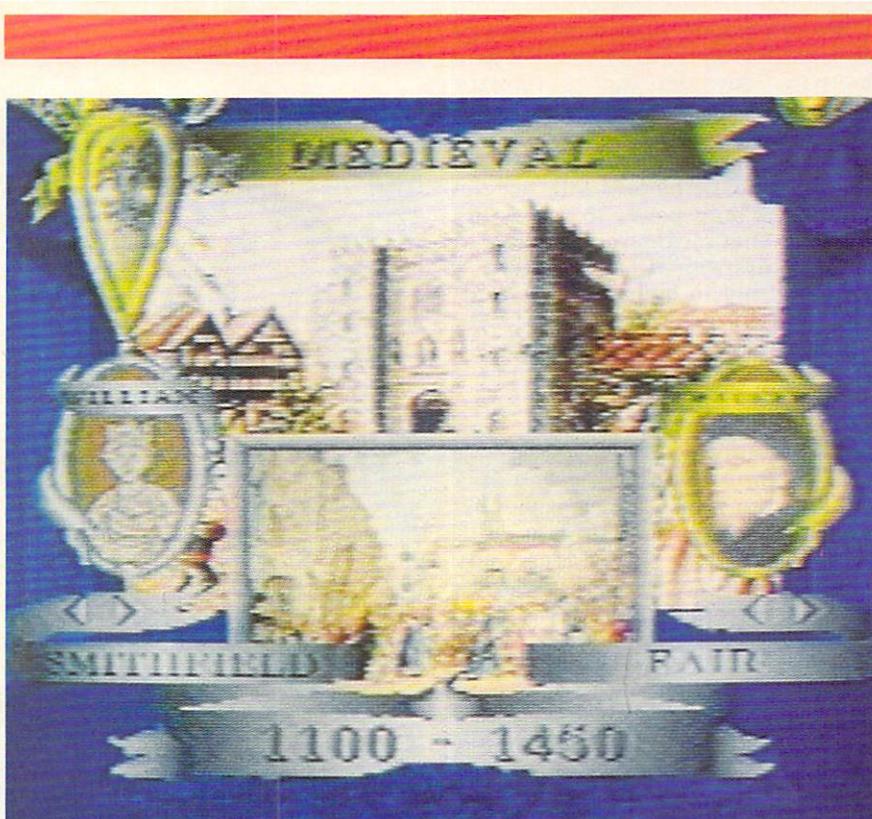
As for the multimedia encyclopedia that is often held up as the crown prince of CD-ROM, don't expect to see it in stores for some time. Says Bill Harlow, president of Publisher's Data Service Corp., a company that compiles data for CD-ROMs, "We're a long way from home CD-ROM. It's still a business product, and it will be until the volumes are built up enough to justify the demand."

"couch potatoes." Even marginally interactive media—such as newspapers, talk-radio, and VCRs—are two-dimensional. With these media, you can't explore beyond a certain point. Computers will add a third dimension that allows you to dig deeper and more broadly into information.

Third, computers—especially in schools and workplaces—will be linked together. Individuals now "massage" data; in the future, a group effort will be needed to derive sense and value from the overwhelming quantity of data.

THE GRAPHICAL INTERFACE

The use of icons and graphic displays on computer screens and fancy fonts in computer printouts is so widespread now that people already take them for granted. It wasn't always that way. The graphical interface popularized by the Macintosh was introduced to the mass market in 1984, but didn't really take hold for another year or two. One reason for that, apart from many users' and manufacturers' reluctance to change, is that graphics require memory. The first Mac had a mere 128K. Now that memory is cheap—1MB is standard on several new computers—the graphical interface will predominate.



London Any Way You Turn (The Record Group) is CD-I software under development. It allows you to tour London streets, even looking at the same street in ages as different as Caesar's and Chaucer's. CD-I players connect to both TVs and stereos.

CD-I: A CD CONNECTED TO A TV OR STEREO

A Video Game Machine for the 1990s?

In 1865, Western Union passed up a chance to patent the telephone, thinking that the telegraph would continue to reign supreme. So Bell Telephone took the patent. Trip Hawkins, president of Electronic Arts, doesn't plan on making the same kind of mistake Western Union made. "In terms of a consumer product, the telephone had the same advantages over the telegraph that CD-I has over computers: It was cheaper, it was a standard, it provided realism, and it was easy to use."

So Electronic Arts, one of the leading consumer software companies, is already working on CD-I products, even though a prototype CD-I player isn't even available.

CD-I—the "I" stands for "Interactive"—refers to specifications for a CD-I player. The player will connect to a TV (as video game machines do) and a stereo (as a regular CD player does). A CD-I player will play regular audio CD—as well as CD-I software that can store music, text, still images, and partial full-motion video (which occupies only a corner of the TV screen).

Prototype CD-I players (based on the Motorola 68070, a variant of the 68000 used in several computers) for developers are expected soon, and actual players and discs may be in stores by the end of 1988, but more likely, not until 1989. Initially, CD-I players will cost about \$1,000, but the price is expected to drop quickly. CD-I

players will come with a mouse or joystick controller; a keyboard may be optional for computerlike applications, although text display will be limited by the TV.

CD-I's adherents—and they are many—think CD-I is the best thing since CD audio and will reach people who have never touched computers. Jointly developed by Sony and Philips, co-developers of the audio CD technology, CD-I is a standard that has been agreed on by all the world's leading consumer electronics companies.

CD-I's critics—and they are few but vocal—think CD-I is overrated and can't make it as a consumer product because it doesn't allow full-motion video (basically 30 frames per second). However, CD-I should be able to deliver full-screen, full-motion video in about three years, according to Philips.

What kind of CD-I software will be developed? First, since a CD-I player has full CD-audio capabilities, you can expect music to be combined with animation and still images. In addition, CD-I discs can hold up to eight hours of music, at a lower quality than CD audio, and up to 8 hours of speech. Thus, music or speech could be combined with typical computer software. "I can see *Bard's Tale* with a story by Paul Newman or some such celebrity," says EA's Hawkins. "Other possibilities are *DeluxePaint* with a library of art or *Starflight* with aliens that come to life."

Since CD-I is still on the drawing

boards, not many companies are designing software. Development costs on most titles will be at least \$200,000, and that investment doesn't make sense until the CD-I players are on the market. Probably the biggest developer is American Interactive Media (AIM), a joint venture of Philips and Polygram Corp. AIM has signed agreements with Parker Brothers—producer of several hand-held and arcade video games—to produce CD-I games and with the Smithsonian Institution, to produce CD-I versions of Smithsonian books. The first Smithsonian CD-I release will be based on *Treasures of the Smithsonian* and will detail 200 of the museum's most famous items, including the Hope Diamond and the Apollo 11 space capsule.

The Record Group, formerly a sister company to AIM but now an independent venture, is also a CD-I development company. One of its projects is called *London Any Way You Turn* and allows you to walk through London, going where you wish. You can also move back in time and look at the same street in Caesar's and Chaucer's times.

"If you added the capability of a video-disc—full-motion video—CD-I will appeal not only to lawyers, but also to the masses," says Stan Cornyn, president of the Record Group. "Bruce Springsteen's latest and *Grolier's Electronic Encyclopedia* and *Rambo* will all be part of the same family."

"We can exploit these new memory levels to provide a higher level of productivity," says Jeff Raikes, director of applications marketing at Microsoft. Raikes says that rather than cramming more and more features into software, developers will "use the computer's horsepower to access the features. That means you'll be able to use brainpower to accomplish a goal—and not to figure out the computer. With graphical interfaces, complex, full-featured software will be as easy to learn and use as today's simple, straightforward programs. But it will do much more than today's high-level software."

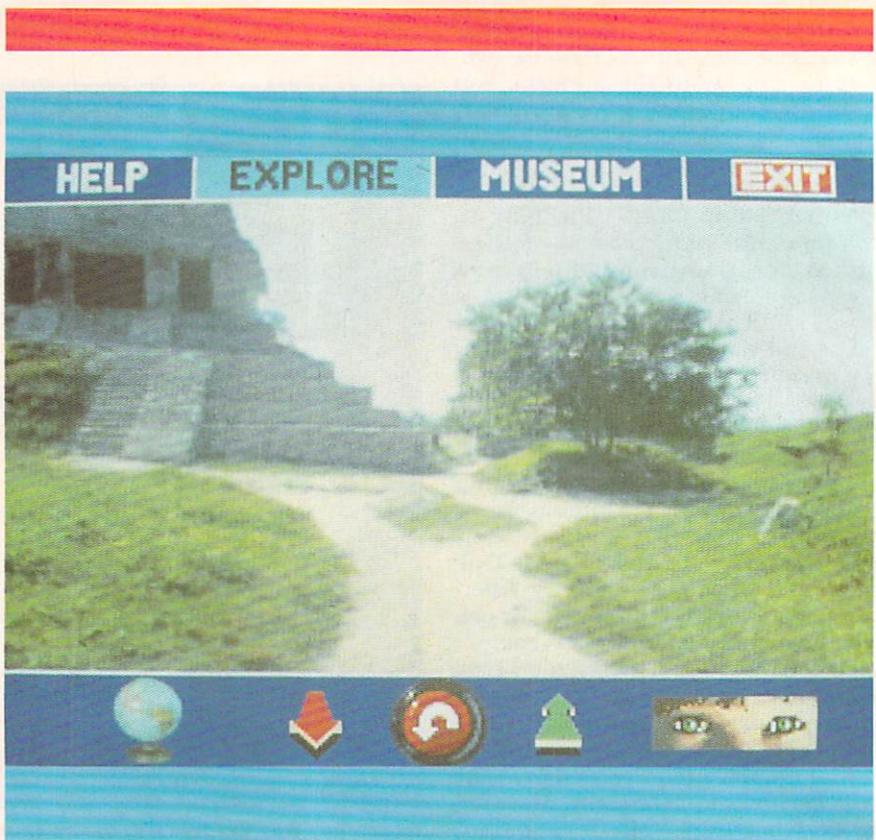
In communications—which has not grown as fast as expected because it can be intimidating and difficult—graphical interfaces may spark an upsurge. Dialog, the world's largest electronic database vendor, has more than 300 databases. Many use different commands and require different searching techniques, making research a job for a trained librarian. But now Dialog is developing a graphics-oriented "front end." This front end, which uses *HyperCard* on the Macintosh, will allow users to point-and-click their way through all the databases, regardless of the databases' internal command systems.

Prodigy, the new videotext system developed by Trintex (an IBM and Sears joint project expected to premier in 1988), is being built from the ground up as a graphics system. Besides making the service more inviting and easier to use, graphics will allow advertisers to display their wares. CompuServe, the largest videotext vendor, also is reportedly working on a graphical interface to replace its current all-text, command-driven service.

Beyond making applications software or videotext services easier to use, graphics will make information easier to organize and interpret. For instance, Apple's *HyperCard*, a very graphic point-and-click information manager, is ideally suited to control videodiscs and CD-ROM. "How can you access half a gigabyte of information?" asks Bill Atkinson, designer of *HyperCard* and the classic *MacPaint*. "You can't do it without a fast, graphical interface."

NEW INTERACTIVE MEDIA

Why is this better with a computer? For any number of tasks, this question can be answered simply: "Because it's interactive." The ability to tell the computer to "do this" or "do that" separates the computer from familiar technology, such as TV.



DVI allows you to show full-motion video on your computer screen. Here, a demo put together by the Bank Street College allows you to tour Palenque, part of the Mayan ruins. DVI, developed at the David Sarnoff Center, is owned by General Electric.

DVI: CD-ROM WITH FULL-MOTION VIDEO ON A COMPUTER

The Ultimate Flight Simulator?

"What we're aiming toward—but are a long way from—is a box that sits on top of the TV that takes CD discs," says Garry Kitchen, president of Imagineering Inc., a software development firm. Kitchen, author of Activision's *Garry Kitchen's Game-Maker*, is working on a demo flight simulator for Activision and RCA labs to show off the potential of DVI. "This could rival the kind of simulator they have at Boeing," says a CD-ROM developer.

DVI, which stands for Digital Video Interactive, was developed at RCA's David Sarnoff Research Center, and the technology is now owned by General Electric. Unlike CD-ROM, which defines a method of storing data on disk, and CD-I, which is a specification for a playback system, DVI is a chip set that allows a computer to read CD-ROM.

In prototype form, the chip set is currently held on three boards that plug into an IBM PC AT or compatible. These boards control a CD-ROM drive and run CD-ROM software. Later on, a DVI player may be built as a stand-alone unit, much like CD-I.

Unlike CD-I, the DVI driver allows full-screen, full-motion video (30 frames per second). That could be a threat to CD-I, since TV-style video is what the world

wants. Eyewitnesses say that DVI's full-motion video is of comparable quality to an average VCR tape—far better than what's available on a computer screen today. In addition to full-screen, full-motion video, DVI can also deliver still images, CD audio, graphics, and computer data.

But perhaps the most noteworthy aspect of DVI is its ability to produce realistic three-dimensional graphics. "In a flight simulator, you can fly over a landscape where objects look real, and you can examine them from 360 degrees," says Kitchen. For example, Kitchen has created a computer model of a building—composed of computer data and photographs to make it look real—that you can fly around. You could film this, but it's impractical for a simulator because you never know where people will decide to fly.

This "synthetic" video has unlimited potential, but the value of real filmed video is also clear. In a Bank Street College demo, which shows a tour of Mayan ruins, you can walk into a room and read an inscription. Then, in a window on the screen, you can watch and listen to a professor explain the inscription, as if you were watching TV.

"DVI is very exciting. And, by using CD-ROM, it's taking advantage of an existing market," says Meridian Data's Meyer.

Even an interactive, but fixed, medium such as the videodisc turns into a different creature when connected to a computer—because the computer will let you structure your viewing on many levels. At the same time, the videodisc turns the computer into a different creature, since videodiscs deliver TV-like full-motion video, rather than the graphics or animation the computer alone can deliver. Even though neither technology is new, the cross-fertilization creates a new medium.

For example, by controlling the information with *HyperCard*, The Voyager Company's *The National Gallery of Art LaserGuide* lets you tour that museum's complete collection. Using the computer, you can choose to view paintings from a particular century, artist, or school of painting. Then the videodisc takes you on your personalized tour. If you want background information on a certain painter, you can also get relevant textual information.

The videodisc, of course, is static. Once the material is recorded, you cannot change it. But what happens when you use the computer with a dynamic medium, such as electronic information? Then you can not only design the information you see in front of you—but the information that you'll see tomorrow. At least that's the direction in which we're heading.

Bill Dunn, executive vice president of Dow Jones & Company, Inc., sees the day when each Dow Jones News/Retrieval (DJN/R) subscriber will be able to receive a personal newsletter daily. You'll use the computer to pick five or 10 companies that you follow. DJN/R will take that information, cull news stories and stock prices from its vast database, assemble it into a newsletter format, and send it to you. When you sign on, you'll be able to laser print the newsletter and read it while you drink your morning coffee.

Trintex's Prodigy is expected to work along similar lines. "Two people in the same neighborhood will sign on and see completely different services, ones that they've customized for themselves," says Brian Ek, a spokesperson for Trintex. News hounds will be presented with news, sports hounds with basketball scores, and so forth.

Beyond that, even people with the same interests may see a different service, because they will see ads targeted at their demographic group, based on information they've given their computers.

People want interactive informa-

tion, judging by preliminary research from the Audience Research Facility of the M.I.T. Media Lab in Cambridge, Massachusetts. "Broadcasts" of interactive "Dallas" TV shows and the "CBS Evening News with Dan Rather" have been shown to test groups in a lab set up at a Massachusetts shopping mall. Viewers can choose subplots emanating from one "Dallas" broadcast inserted at the beginning of a regular show. For the news, viewers see quick glimpses of all the news stories at the beginning of the broadcast and can choose the ones they want to watch. After each story, there's a menu of choices that offers background footage on a given story. In essence, people can customize their own news show.

"In general, viewers disliked 'Dallas' and liked the 'CBS News,'" says Dr. Diana Gagnon, a postdoctoral Fellow at The Media Lab. "Information is much easier to present interactively than [is] entertainment."

Children, of course, might respond better to interactive entertainment on TV. Mattel sells a hand-held jet plane that interacts with "Captain Power and the Soldiers of the Future," now airing on Saturday morning TV. The plane fires at "enemies" on TV, and the TV fires back. "Soon you'll see toys that respond to signals from a TV," says Gagnon.

INTERPERSONAL COMPUTING

"The next step is *interpersonal computing*," said Apple's Sculley in his keynote address at MacWorld Expo last summer. "The future of interpersonal computing [involves] the ability to look at work in two windows—with one window showing another person's work on another computer."

Sculley and others had previously used the term *connectivity* in a similar context, but interpersonal computing perhaps makes more sense—especially as computers are more and more capable of personalizing an individual's work. At the same time, the increased flow of information will overwhelm people—unless it can be moved and analyzed by co-workers.

Already, with its new *MultiFinder* software, the Macintosh can concurrently run two or more applications (including MS-DOS, Macintosh, and Unix types) in different windows. And Macintoshes, IBMs, and other computers can be connected to each other through local-area networks (LANs) or modems. Being able to see another person's application running under a different operating system

on your computer is not that fanciful a notion. When Microsoft's OS/2 operating system is finished next year—which allows various 80286-based and 80386-based computers to run two or more programs simultaneously—*interpersonal computing* should begin in earnest.

Microsoft's Raikes thinks that OS/2 will foster work groups connected by computer. Annotated files could be circulated with new comments merged as they move, so that you'd always be able to tell who had seen and commented on which files.

Raikes also foresees multi-user databases. Unlike today's databases, which can be accessed from a file-server by different users, the multi-user database of tomorrow will allow each user to design his or her own structure. Similarly, multi-user calendars will allow people to see and update each other's calendar.

IN THE YEAR 2001

It's so easy to talk about the future, to make it sound so clean. It's so easy to forget the tangle of cables under our desks that tie up our ankles as we compute; the screaming frustration that error messages induce; the credit card bills that mount as we try to assemble a system that works like a dream. But let's forget these current-day woes, move the calendar fast forward to the twenty-first century, and imagine the Knowledge Navigator, "a wonderful fantasy machine" described by Sculley in his book *Odyssey* (Harper & Row).

"Individuals could use it to drive through libraries, museums, databases, or institutional archives. This tool wouldn't just take you to the doorstep of these great resources as sophisticated computers do now; it would invite you deep inside its secrets, interpreting and explaining—converting vast quantities of information into personalized and understandable knowledge. What you see on the large, flat-display screen will likely be in full color, high-definition television-quality images, full pages of text, graphics, [and] computer-generated animation."

"Most important, the Knowledge Navigator will customize knowledge for you—it learns as you use it—to make navigating through information and ideas as interesting and understandable as possible. If you are visually oriented, you could work with the animated windows; if you are textual, you could work primarily in a text mode."

Will it ship in time for the holidays—2001? ■



Home-Office SHOPTALK

AN EXPERT'S ADVICE ON STARTING, MAINTAINING, AND EXPANDING A HOME-BASED BUSINESS

BY JOANNE H. PRATT

Let's begin 1988 with this resolution: *Make sure your home office doesn't make you look homemade!*

For instance, a letter you write asking for someone's business or for a job is the only part of you that a prospective client or employer will ever see—unless your letter makes a terrific first impression. Does your letter look like the kind of mail this business would send out?

Your letter is *you*. Be professional. Use a business format. Be guided by the sample letters in your word-processing manual or, better yet, copy the format of the most impressive letter you've received. I also recommend referring to Tom Jackson's *The Perfect Resume* (Anchor Press, 245 Park Avenue, New York, NY 10167).

Correct your spelling with your spelling checker. To gauge the impression that your letter might make, ask a friend or business acquaintance to read it. And finally, save your tractor paper for drafts and copies. Print your golden works with a new ribbon on good-quality paper.

Give your sales letter your best shot—it may be your only shot.

Q: I have an MS-DOS computer at home that I use for doing accounting and other work for area businesses. I have a prospective customer who operates a small business from his home, making and selling crafts (driftwood wall hangings and centerpieces, for example) to businesses and flea markets. He has been selling his wares by personal contact, but now wishes to start selling via mail.

The problem: I know how to build a mailing list with my database and how to address labels with my equipment, but I'm at a loss on how to obtain a list of gift shops or dealers. Can you advise me on how and where to obtain information on dealers' names, addresses, and other pertinent material? —D. FETH, Akron, New York

A: There are several ways that you could help your new customer develop a mailing list for his crafts. To assemble your own list of dealers, the brute-force method is to copy names and addresses from the Yellow Pages listings under "Gift Shops."

Watch for the *Guide to Galleries USA*, which is scheduled for publication this spring by *American Craft Magazine*. Or you can inquire about it from R.C. Schade and Associates, Inc. (900 Albany Post Rd., New Paltz, NY 12561; [914] 255-5840).

You can also look for the few dozen dealers listed monthly on the back page of *The Crafts Report*. If you don't find the periodical in your library, write for copies to: 700 Orange St., P.O. Box 1992, Wilmington, DE 19899; (302) 656-2209.

As you may be aware, direct-mail marketers usually get their contacts through mailing-list brokers. The brokers maintain up-to-date files of names and addresses of

JOANNE H. PRATT, president of Joanne H. Pratt Associates, Dallas, Texas, has 28 years of experience in operating home-based businesses. Her business conducts research and consults for private and government clients.

stores subdivided by location and type, for instance.

For instance, Name-Finders Lists Inc. (253 West 28th St., Suite #409, New York, NY 10001; [800] 228-8939 or [212] 239-0484) rents the use of names and addresses that it has compiled from major sources, including the Yellow Pages. But because the company's lists have been categorized, you can target specific markets for your products. The brokers know their lists very well, so you will get a lot of good ideas just by calling them up.

Bob Drew of Name-Finders Lists suggests, for example, that his lists of 3,600 hospital gift shops or 1,200 candle shops might be potential sources of customers for driftwood items. He also has a general list of 64,000 gift shops nationwide.

There's no sure way of knowing ahead of time which list will have the most potential customers. However, brokers will usually let you test their lists, subject to a minimum charge that varies somewhat from one broker to another.

Name-Finders Lists generally charges \$40 per 1,000 compiled names for each of the lists mentioned (plus \$6 for every 1,000 if you want self-adhesive labels). To meet their 5,000-name minimum order, you could ask for every eighth name on the list of florist shops. That would give you 5,500 names and addresses, on peel-and-stick labels and arranged by zip code, for less than \$300. Or you could sample several of the most likely lists.

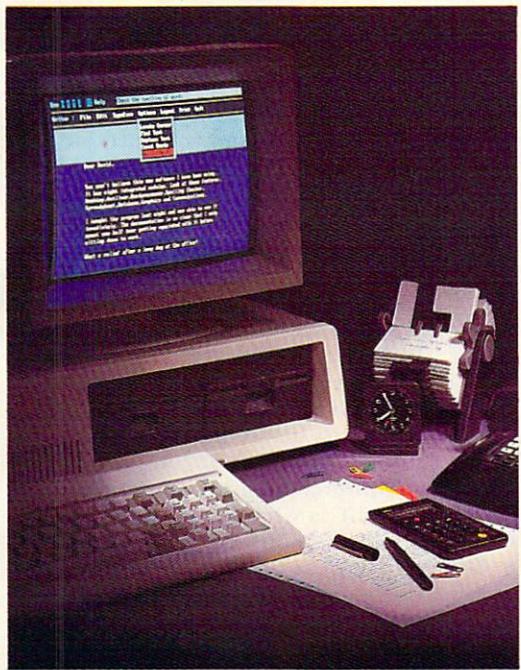
If orders flood in, you can then buy the rest of the names on the most productive list. You can use the names only one time, but you are free to use the names of people who respond to your mailing to begin building your list.

Q: I operate a home-based word-processing business (Screen Scene) targeting the medical and legal fields. I plan to upgrade to a more powerful MS-DOS computer and laser printer. I would like to lease the equipment but since I haven't been doing a large volume of business for long, it has been difficult to obtain a lease. I really can't afford the capital outlay that this equipment requires. Any suggestions? —T.L. BRANYON-ROSS, Chicago, Illinois

A: Specializing in medical and legal clients is a wise choice that should lead to a profitable business, if you persevere. Unfortunately, it takes time to establish a business credit rating. I suggest that you investigate getting a loan to buy your equipment since that often costs less than leasing the equipment. The Small Business Administration booklet *The Business Plan For Home Based Businesses* (#MA2.028) discusses sources of credit.

Don't overlook the possibility of applying for a guaranteed SBA loan or even borrowing from one of your clients. You probably have already thought of approaching your family, your friends, or a bank. Eventually, building up your accounts receivable will give you access to a line of credit. But in the interim, you will need either collateral, such as bank CDs, against which you can borrow, or a business plan with realistic financial projections. ■

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The **DESKTOP ORGANIZER** keeps track of appointments, issues reminders of birthdays and anniversaries. The "To-Do" List helps you organize your day-to-day obligations and the Address Book keeps all your important names, addresses and phone numbers.

The **OUTLINER** provides you with a structure for organizing major and minor points into a coherent writing plan before you actually begin.

The "What You See Is What You Get" format of our **WORDPROCESSOR** makes creating documents a breeze. What you see on the screen is what will appear when you print. The Wordprocessor features full editing and formatting functions such as cut and paste, word count, search and replace, directory listing, centering, text justification and settings for margins, tabs and line spacing. Design the layout of your document with headers, footers, automatic page numbering and an automatic table of contents. Special print features can be used, such as underlining, boldface, italics and compressed print. It's easy to set-up your printer... simply select your printer from the list of preset printer models.

The 100,000 word **SPELLING CORRECTOR** captures over 99% of spelling and typing errors and suggests correct spellings for misspelled words.

Eight-In-One's **SPREADSHEET** gives you Lotus 1-2-3 file import and export.

The **DATA BASE** can read and write in DBASE III compatible files. You can search by any field and create reports on the information on file.

Present your numerical analysis visually with our **GRAPH** program. Create bar charts, point and line graphs and pie charts.

Eight-In-One's **COMMUNICATIONS** program takes full advantage of the features of Hayes compatible modems.

Better Working Eight-in-One



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DBASE III is © of Ashton-Tate.

PRODUCT REVIEWS

EVALUATIONS OF COMPUTERS, PERIPHERALS, AND HOME-OFFICE EQUIPMENT

COMPUTERS

Tandy 1400LT

MANUFACTURER: Tandy Corporation
ADDRESS: 1800 One Tandy Center,
Fort Worth, TX 76102; (817) 390-
3011

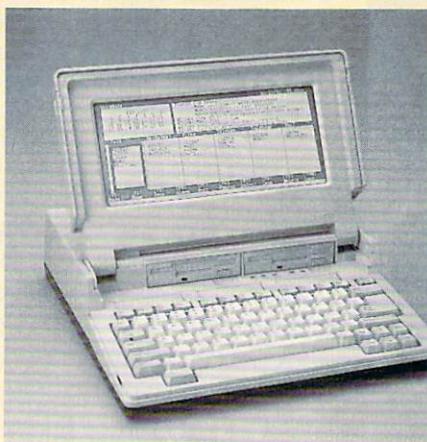
PRICE: \$1,599

The Radio Shack Model 100 was the first widely used laptop computer; and among journalists and writers, it was indispensable. But since it was not compatible with the emerging MS-DOS standard and, therefore, couldn't run programs such as Lotus 1-2-3, it didn't reach the wider audience it might have.

Many thought it ironic that the company that established the laptop market would fall so far behind in the arena it helped to create. But one should be careful not to underestimate the folks from Fort Worth. They've proven naysayers wrong in the past and may do it again.

The latest Tandy foray into the compatible laptop wars is the 1400LT. It's an MS-DOS compatible that comes with just about everything one could want in a laptop, including a readable 25-line, backlit supertwist liquid crystal display (LCD) screen and a speedy 7.16MHz NEC V-20 microprocessor (an 8088-compatible microprocessor is found in the original IBM PC). It also comes with 768K of RAM (640K of main memory and a 128K RAM disk), two 720K 3.5-inch floppy drives, a full-function keyboard, a rechargeable battery, parallel and serial ports, and connectors for an external 5.25-inch disk drive, an auxiliary keyboard, and external monitors (both RGB and composite). In short, it has nearly everything you could want in a regular desktop—but in a 13.5-pound package.

My two complaints (and fairly minor ones at that) with the 1400 concern its weight and the keyboard. At first, 13.5 pounds doesn't seem to be a lot of weight, but after carrying it around awhile it starts to feel



TANDY 1400LT SPECIFICATIONS

MICROPROCESSOR: NEC V-20
(4.77/7.16MHz)

MEMORY: 768K (640K in main memory,
128K in a RAM disk)

OPERATING SYSTEM: MS-DOS 3.2

WEIGHT: 13.5 pounds

DIMENSIONS: 14.5-by-3.5-by-12.4 inches

DISPLAY: Backlit supertwist LCD, 640-by-
200-pixels, 80-characters-by-25-lines

BUILT-IN PORTS: Six (parallel, serial, RGB,
composite, external disk drive, and en-
hanced keyboard)

EXPANSION SLOTS: One proprietary

DISK DRIVES: Two internal 720K 3.5-inch

BATTERY: Rechargeable 12 volt; four hours

continuous use, eight-hour recharge

SOFTWARE INCLUDED: GW-BASIC, MS DOS
3.2

WARRANTY: 90 days

much heavier. I took the 1400 on several business trips, and it caused no problem (though it's a tad long for airline fold-down trays). But lugging it through airports and train stations, in and out of cabs, and on a mile-long hike around downtown Washington, D.C., left me longing for the three-pound Tandy 102. The built-in handle is secure, but I always felt a little uneasy using it because it seemed to be a bit on the flimsy side. (A carrying case is now available for \$40.)

The keyboard also leaves something to be desired. In order to get a full-size keyboard on the 1400,

Tandy engineers doubled up on some keys. The numeric keypad has vanished and is now buried among the regular keys. HOME, CAPS LOCK, PGUP, PGDN, END, and NUM LOCK are all on the cursor keypad along with the INS and DEL keys. In order to activate these functions, Tandy has added the FN key. I guess it's a suitable compromise, but there is a database program I use that calls for extensive use of the PGUP and PGDN keys. What was a one-finger job before has now become a two-finger task.

Minor complaints aside, the 1400LT is what an MS-DOS, let alone a laptop, computer should be—easy to use, reasonably priced, and expandable, yet requiring few options to make it useful. It's a standout in the increasingly crowded laptop field.

—STEPHEN MILLER

CIRCLE READER SERVICE 100

Toshiba T1000

MANUFACTURER: Toshiba America, Inc.
ADDRESS: Information Systems Division,
9740 Irvine Blvd., Irvine, CA
92718; (800) 457-7777, (714) 583-
3000

PRICE: \$1,199

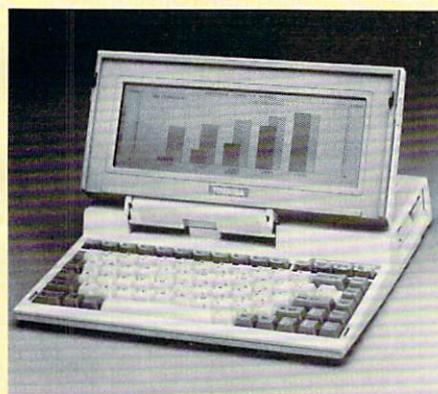
The recent computing-on-the-go trend has been to build so-called portables that are marvels of engineering, with built-in hard-disk drives, backlit LCD or razor-sharp gas plasma displays, and the speed of powerful desktops. However, all these features require muscles to lug around, a significant wad of cash to purchase, and accessibility to an electrical outlet.

Not so with the Toshiba T1000. This lightweight portable embodies the philosophy that "less is more." It weighs in at just 6.4 pounds, is widely available for less than \$1,000, and boasts a battery life of up to five hours on a full charge. By keeping the laptop's features, price, and weight at a modest level, Toshiba may have produced the perfect machine for those who want to tackle

basic computing tasks on the road. The screen is an attractive example of supertwist LCD technology, with a readable 80-column-by-25-line display and compatibility with CGA graphics. Dark blue letters on a light green background proved to be easily readable in many kinds of lighting, including outdoor and overhead fluorescent. On the other hand, if you're planning to compute your way cross-country in an airplane seat or take notes in dimly lit corridors, you'll want a screen that generates its own light, either through backlighting or a gas plasma display—options unavailable for this machine, but available on other Toshiba laptops.

Speed is not the T1000's strong suit. It chugs along at an old-fashioned 4.77MHz (as does the IBM PC). That performance level is fine for word processing but may prove frustrating when trying to handle large spreadsheets or databases.

An attractive but expensive option (\$549) is a 768K memory expansion card that can increase the 1000's memory to 640K (from 512K) or add up to 768K of expanded (EMS) mem-



TOSHIBA T1000 SPECIFICATIONS

MICROPROCESSOR: 80C88 (4.77MHz)
MEMORY: 512K
OPERATING SYSTEM: MS-DOS version 2.1 (built into ROM)
WEIGHT: 6.4 pounds
DIMENSIONS: 12.2-by-2.05-by-11 inches
DISPLAY: Supertwist LCD (not backlit), 640-by-200-pixels, 80-characters-by-25-lines
BUILT-IN PORTS: Six (parallel, serial, external 5.25-inch disk drive, RGB, composite, and external keypad)
EXPANSION SLOTS: One
DISK DRIVES: One internal 720K 3.5-inch
BATTERY: Rechargeable 12 volt; five hours continuous use, eight-hour recharge
SOFTWARE INCLUDED: Borland International's SideKick
WARRANTY: One year

ory. Or up to 720K of this expanded memory can be configured as a battery-backed RAM disk, which will retain files for up to 18 days even while the system is turned off (as long as the battery is charged).

Another option that is really more of a necessity in a laptop is the Hayes compatible 1200-baud internal modem (\$399). The modem worked fine once it was installed, though the installation itself was unnecessarily difficult—the case is tricky to open, and the cable connection is delicate at best. If possible, let your dealer install the modem.

What can you expect from a \$1,000 laptop? An adequate keyboard and display, an excellent battery life, lightweight portability, MS-DOS 2.1 built into the system ROM, and a one-year warranty that provides an immediate loaner or replacement within 48 hours at no additional charge. That's a winning combination for many potential portable users.

—STEVE MORGESTERN

CIRCLE READER SERVICE 101

PERIPHERALS

DaynaFile

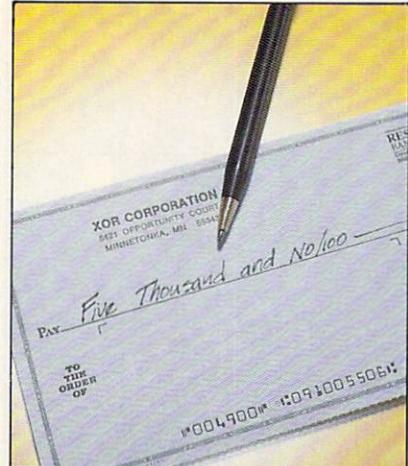
MANUFACTURER: Dayna Communications

ADDRESS: 50 S. Main St., Suite #530, Salt Lake City, UT 84144; (801) 531-0600

HARDWARE REQUIREMENTS: Macintosh Plus/SE/II
PRICE: \$595-\$1,029

If you need to move files regularly between a Macintosh and an MS-DOS computer, then you'll probably appreciate the new DaynaFile drive system as much as I do. I work on a Mac in an office where some of my co-workers use IBMs or compatibles. In order to share documents with others, I used to transfer the files between operating systems using two modems, two computers, and two communications programs. A cumbersome method, to say the least.

Now when I need to give a colleague an article edited on the Macintosh, I simply save the text to an MS-DOS formatted disk in the DaynaFile drive in the same way I save it to a regular Mac disk. And when someone hands me an MS-DOS disk, I can load the work into my Macintosh rather than go through the time-consuming, two-modem—computer-program method.



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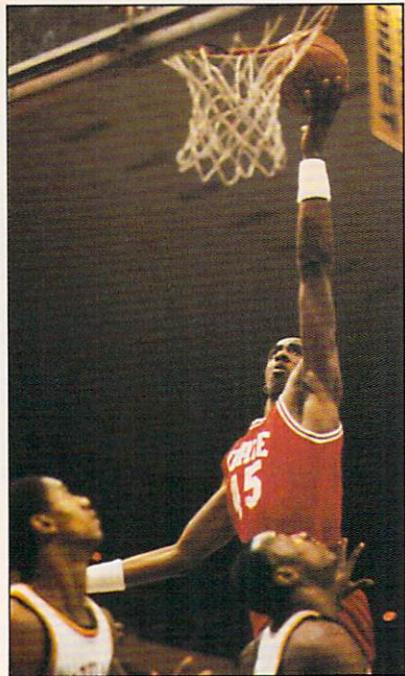
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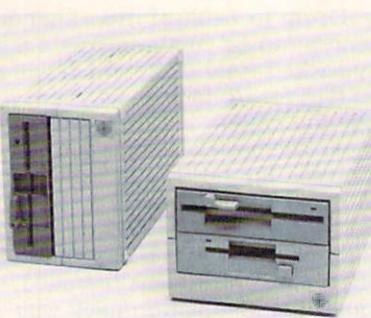
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PRODUCT REVIEWS



The DaynaFile drive system lets Macintosh owners read and save to MS-DOS-formatted disks.

The DaynaFile system can contain a mix of either one or two drives from the following types: 360K 5.25-inch (for the former standard MS-DOS disk); 720K 3.5-inch (for the newer high-capacity disk); 1.2MB 5.25-inch (the high-density AT-type drive); and 1.44MB 3.5-inch (same as in the IBM PS/2 Models 50, 60, and 80). Note that it lets you share or transfer data files, but it doesn't enable you to run MS-DOS programs on your Macintosh.

Our review unit had one 360K and one 720K drive, and once I set it up, it performed flawlessly. Not only did I transfer text files between operating systems, but I used it to move MS-DOS programs from the 360K 5.25-inch disk to the 720K 3.5-inch disk (the Mac as an MS-DOS peripheral!). I also loaded Lotus 1-2-3 worksheets directly into Excel on the Mac with all the formulas intact, and then I took several dBase III Plus databases and moved them into McMax (a Macintosh dBase clone) without a hitch.

Setting up the DaynaFile, however, caused me some anxiety. At first I had problems with the cabling and SCSI terminator, which messed up my Mac hard drive. (I had to reformat my hard drive to fix the problem.) But after the manufacturer sent a new cable and SCSI terminator, all went well.

Beyond cabling the unit to your SCSI port, setting up the DaynaFile is extremely simple. All you have to do is drag the DaynaFile program into your Mac's System Folder and set the device's SCSI ID number by pressing a button on the unit. The manual is clear and well-illustrated, and the unit optionally comes with Translation Software for additional help in transferring formatted documents (\$95 extra). The technically minded will be interested to know

that the Mac treats each MS-DOS disk as if it were a normal Mac disk by creating a separate, invisible, Macintosh directory on the MS-DOS disk, letting the Mac read and write to it.

If you're someone who uses both an MS-DOS computer and a Mac—maybe you use an IBM compatible at work and have a Macintosh in your home office—you, too, will probably appreciate the DaynaFile. It's my favorite type of peripheral—invisible in operation once it's up and going.

— DAVID HALLERMAN
CIRCLE READER SERVICE 102

HOME-OFFICE EQUIPMENT

Brother FAX-100

MANUFACTURER: Brother International Corporation

ADDRESS: 8 Corporate Place, Piscataway, NJ 08855; (201) 981-0300
PRICE: \$1,495

A fax phone is almost as easy to use as a telephone. You plug it in, scan the directions on the product itself, and go to work. At least that's what I did with the Brother FAX-100, one of these new technological marvels that act as combined telephones, copiers, and facsimile machines.

To get the feel of the new unit, Brother provides a "test sheet," on which you write your name, address, phone number, and the unit's serial number. You tuck the paper under the feed slot. The ORIGINAL READY light goes on, and you're ready to go. You dial Brother's number and when you hear a high-pitched tone, you push START.

The paper slowly feeds through the machine. As it does, the machine scans and sends the document to Brother's fax phone on the other end, where it prints out. (The FAX-100 can communicate with other Group 3 fax machines, which make up the bulk of units found in offices and homes today.) It's one of the fastest and cheapest ways to send a document; you pay only for the cost of the phone call. The typical 8.5-by-11-inch sheet takes 45 seconds to send.

To test whether your new machine can receive as well as send, you place it in AUTO-ANSWER and wait for a return transmission from Brother. Mine arrived within a few minutes. The phone rings once before making the connection. Then the machine begins to hum and

shake as the received document slowly prints out.

Computer users who have trouble with modems and printers will be amazed at how effortless it is to send and receive documents—with pictures! Once you say, "Gee whiz," however, you then begin to examine the product more carefully. Here's a rundown of the high and low points.

Paper. Fax paper, which is some variant of the old thermal printer paper, comes on a roll that is 8.5 inches wide. Though documents you send or receive cannot be wider than 8.5 inches, those you receive can be as long as 100 feet, the length of the roll.



Like other fax machines in its league, the Brother FAX-100 is a telephone, copier, and facsimile machine.

I ran through a roll of paper in two weeks and then started searching for a replacement. I discovered that not many people know what a fax phone is and not many people sell paper for them. A Brother telephone representative referred me to a catalog showroom in my region (Massachusetts), which had never heard of fax phones. They referred me to another outfit, which turned out to be a bakery-equipment wholesaler. Before an accomplice at FAMILY & HOME-OFFICE COMPUTING found two rolls in the office, I had established 47th Street Photo in New York City as the place to buy fax paper. The paper is expensive; although prices vary, they seem to average about \$19-\$25 for two rolls.

Copying. To copy a document, you follow the same general procedure as you do to send, except you push the COPY button instead of the START button. The Brother FAX-100 has a FINE mode that is used when copying, and it gives good, readable results, though not nearly as good as a real copier does.

Whether copying, sending, or re-

ceiving a document, the quality of the images will vary markedly. Charts and graphs are generally clear and sharp, but many newspaper photos are difficult to read. When copying or sending, you can use the contrast switch in back of the machine to make copies lighter or darker.

Operation. The Brother FAX-100 is compact and light and attractive—designed for visible desktop display. However, when it's in operation, you can hear and feel the wheels churning. My desk, which is new and sturdy, vibrates when the fax machine is working, and my computer screen wobbles. So you're better off putting it on a separate table.

Two other things bothered me. If I want to copy or send a wide newspaper article, I have to cut it and tape it into smaller sections. And I cannot copy or send a page from a magazine or a book unless I rip it out of the publication—or copy it with a more advanced copy machine.

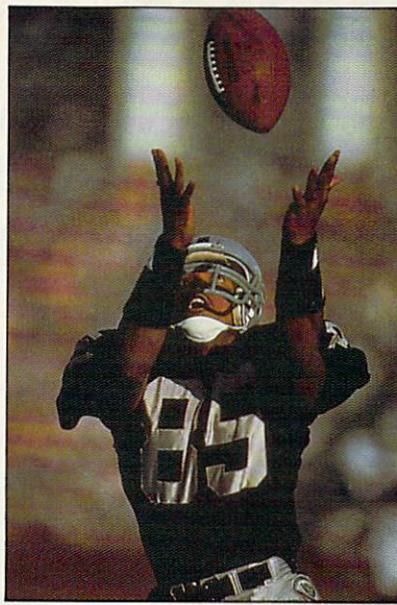
Also, I don't like feeding multipage documents into the machine one sheet at a time. When one sheet is finished, I have to listen for a tone from the machine telling me to put in the next. If I don't get the paper in straight within six seconds, the connection is lost and I have to redial.

Otherwise, the operation is flawless. Hooking it up requires plugging the phone line into a wall jack and the power cord into a socket. Using it requires pushing a few clearly marked buttons. Brother's toll-free number is printed on the machine if you want help. (During the first 90 days, if you have any problems with the unit, Brother guarantees free on-site service within 48 hours.)

All in all, the machine is a solid performer and a loyal desktop companion. It aided and abetted my work in a number of ways, and its learning curve is about as steep as a bowling alley. The only problem I encountered was when I inserted a new roll of paper upside down and received a transmission that did not print out. The faults that I mentioned are endemic to most fax phones in this price range. It's quite clear that once people use these devices, they'll be hooked. And since they all seem to work so well, choosing the right one may become a matter of picking the right color or the best price.

—NICK SULLIVAN

CIRCLE READER SERVICE 103



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CIRCLE READER SERVICE 37

USING HYPERCARD

FIRST STEPS TO MAKING YOUR OWN HYPERCARD APPLICATIONS PLUS: GREAT NEW STACKWARE

BY JOHN J. ANDERSON

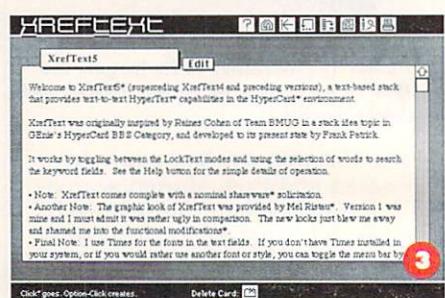
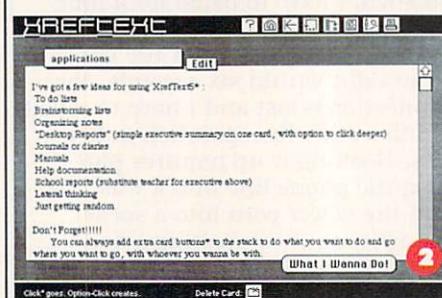
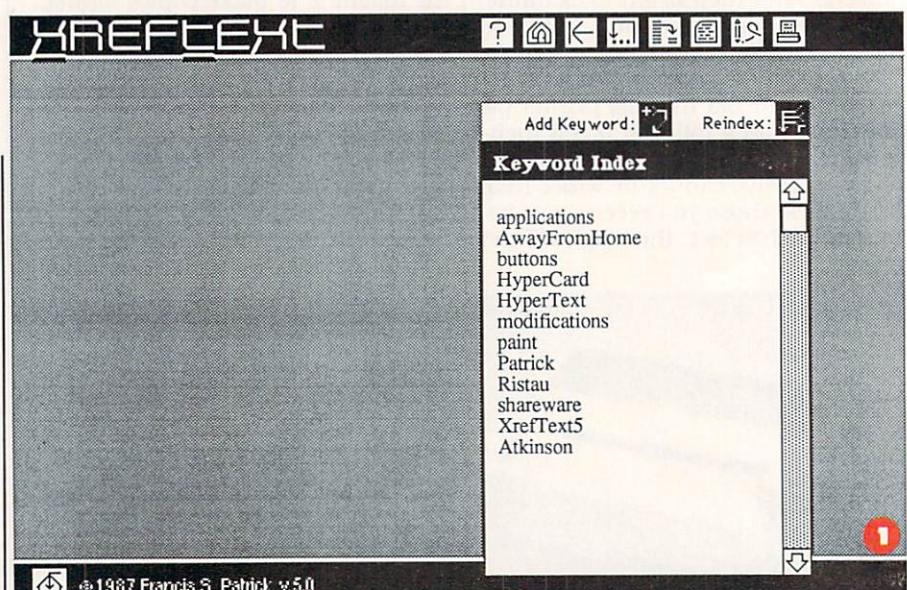
HyperCard has been described as many things: a database, a graphic information manager, a presentation program, a programming language, an educational authoring system. In fact, *HyperCard* is all those things and more.

Imagine, for just a moment, creating your own custom databases, practical applications, and tailored information retrieval systems. Imagine having all the magic of the Macintosh at your disposal in so doing—menus, buttons, dialog boxes, windows, text fields, graphics—all of it available on the fly, with a few clicks or English-like commands. All of it easy to expand upon, modify, upgrade, and customize.

If you can imagine this, you've come close to comprehending the real importance of *HyperCard* and the genius of its inventor, Bill Atkinson. Atkinson makes a good analogy when he says that the advent of *HyperCard* will open up Macintosh software the way the advent of the slotted Mac SE and Mac II opened up Macintosh hardware. With *HyperCard*, you can become an accomplished "scripter," even if you're not a programmer.

DON'T START THE REVOLUTION WITHOUT ME

Though the term "revolutionary" is bandied about far too often in the computer arena—even with regard to *HyperCard*—the fact remains that, while the individual elements of *HyperCard* may exist in other programs, its particular combination of elements makes it unlike all other software packages. For instance, while *HyperCard* offers users a lot of power to control data, it presents its levels of complexity on a "need-to-know" basis, where you learn only as



In the examples above from the XRefText5 stack, clicking on the word **applications** on the Keyword Index card (#1) takes you to the card using **applications** as a keyword (#2). Click on the word "**XRefText5**" on card #2 to take you to its own keyword card (#3).

much as necessary in order to use it effectively. And with that same power comes relative ease—relative, because you still have to think through in detail what you're trying to do; but ease, because *HyperCard* takes care of most of the nitty-gritty details of telling the computer what to do. Rarely has it been so uncomplicated for an untrained user to program a computer.

The most casual users may employ *HyperCard* to browse or to enter data into stacks (as *HyperCard*-generated software is known) written by others. Over time, users can easily learn how to customize existing stacks using a simple set of text and graphic tools. Finally, users may move through the program's graduated levels to actual scripting, which embodies the cre-

ation of entirely new or substantially modified stacks.

The programming language on the scripting level is called HyperTalk; it is among the most powerful and easy-to-use programming languages ever made available. HyperTalk keeps track of all the intricacies of the Mac's environment for you, such as where your text fields are, where your buttons are, whether they have been clicked upon, or where your cursor is placed. All you need to do is clearly state in HyperTalk what you want to have done—*HyperCard* is "smart" enough to take care of the rest.

PUT IT IN PLAIN ENGLISH, PLEASE

Just what do we mean when we call HyperTalk "English-like"? Well, in

JOHN J. ANDERSON, a regular contributor to FAMILY & HOME-OFFICE COMPUTING, started Acme Dot™ Company, which makes *HyperCard* stackware.

THE WORLD OF STACKWARE: A NEVER-ENDING STORY

The already realized potentials of *HyperCard* are so varied and far-ranging that it's hard to get a grip on all the stackware products now available. Productivity stacks, educational stacks, art stacks, story stacks, game stacks, and utility stacks are appearing at an amazing rate. Just to give you some sense of the rate, I was told that in the first 60 days after *HyperCard* was introduced, more than 2.5 gigabytes—that's billions of bytes!—of stacks were uploaded to the GEnie, CompuServe, and Delphi information services.

And now, for the first time on such a wide scale, users can share chunks of useful scripts in a very powerful way. Much of what most of us learn about applying HyperTalk is discovered by examining other people's scripts. Those of you who choose to investigate HyperTalk can join us in a very exciting journey—one in which we will share in the luxury of inventing our tools as we go along.

In this department, we will provide a regular look at the cream of the commercial, free, and shareware stack crop. Commercial stacks, of course, can be obtained through dealers, while free and shareware stacks are available mainly through users' groups or the three on-line services mentioned. In addition, private Macintosh bulletin boards nationwide are fast gaining sizable stackware collections. If you are a Mac owner who is still wondering whether to invest in a modem, the large availability of *HyperCard* stackware may finally provide a compelling reason to commit to a purchase.

STACKS OF THE MONTH

You need not commit to any exploration

of *HyperCard* in order to reap its benefits. Here are some of the stacks we have found that you can put to use immediately.

Note: All stacks on CompuServe (CIS) will be found in the Macintosh Users' Forum (MACUS) in Data Library 8 (DL 8). All stacks on GEnie will be found in the Macintosh RoundTable, Library 15. The actual name the stack is filed under can be found at the end of each description.

XrefText5 means "Cross-Referenced Text, version 5" and it uses *HyperCard's* ability to link text elegantly. **XrefText5** is an applications stack that lets you make stacks of information in which any word can be cross-referenced using your own ways of thinking. Each card in an *XrefText* stack consists of a keyword (for cross-referencing) and a scrolling field for text. (Graphics can be included, but not cross-referenced.) You create a new cross-referenced card for any word in your text simply by clicking on it while you hold down the Option key. The stack's script automatically puts an asterisk at the end of the word in the first card; and then, when you subsequently click on that word, it takes you to the new card with that word as the keyword. The first card in any *XrefText* stack is a keyword index that allows you to add keywords and alphabetically re-index them. If you're in sales, you might use an *XrefText* stack to keep track of accounts and prospects. If your work—like that of writers, educators, and lawyers—involves disparate elements that have essential connections, an *XrefText* stack could be helpful in the planning stages of projects. By Francis S. Patrick (GEnie address: FRANKPATRICK; CIS: 76174.1125). Shareware, \$7.50. Available on CIS (XREFTE.SIT).

Check Writer 1.02 and its companion stack, *Check Register*, take the drudgery out of periodic bill paying and keeping track of your checkbook. You "write" your checks on stack cards that look just like checks. You can then print out the information on your actual checks after aligning them in the printer, or you can wait for an upcoming version of *Check Writer* that will incorporate a printout feature. *Check Writer* even fills in the "longhand" dollars line for you after you enter information in the numeric amount field. The check register stack looks exactly like the check register provided with many checkbooks looks. The balance column is automatically updated, much like a spreadsheet. By Robert J. Alexander (CIS: 75066.3041). Shareware, \$15. Available on CIS (CKWRIT.SIT).

The Vision of HyperCard (also known as *BillSez*) explores the graphics and sound potential of the stack medium. It features animated video and more than 40 seconds of digitized sound. The master's voice itself, that of Bill Atkinson, gives a thumbnail account of the powers of *HyperCard*. Simultaneously, the screen takes you through a simulation of the theoretical possibilities as he describes them. The stack gives you a taste of the potentials that will be realized as the *HyperCard*-CD ROM connection becomes a reality for the Macintosh. The stack is more than 620K, so be forewarned—this file may take nearly an hour to download at 1200 baud. Also, it should be run from a hard disk for proper sound synchronization. But for a fascinating glimpse of the future of information, give it a try. By Tim Oren, an Apple employee (CIS: 76703.2010). Free. Available on CIS (BILSEZ.PIT).

contrast to most computer languages, English has many ways of saying the same thing. In an established programming language for the Mac, such as BASIC or Pascal, there is often only one correct way. In practically every scripting situation, HyperTalk lets you invoke the same command in different ways.

For instance, one of the most fundamental of all HyperTalk commands lets you move from the current card to the next card in the stack. In order to apply this command, you could phrase it in any one of the following ways:

Go to next card
Go to next
Go next card
Go next

HyperTalk has a naturalness that has not really existed before in a computer language designed for the layperson. One way to see this plain-English quality come to life is by

constructing a basic, but useful, script. In the course of using *HyperCard*, you'll often want to insert the current date in your stacks. HyperTalk facilitates this task with simply stated functions that read the Macintosh's inner clock. The flexibility of HyperTalk gives you at least two ways of saying this in a script:

Put the date into card field "Date" or

Get the date

Put it into card field "Date"

In either case, it should be clear to even a novice what is happening here, although the second example adds a step by using the special HyperTalk variable (a container that holds some piece of information, in this case the current date) called *it*. The simplicity of having a special container named *it* makes using *it* possible without even knowing how *it* works. You may, for example, say the following in HyperTalk:

Get the location of button "Good" Click at it

HyperCard will find the location of the button named "Good," place its location in the variable *it*, and automatically click there—just as if you had pointed and clicked the mouse yourself. In actuality, the variable *it* was set to contain the coordinates (horizontal and vertical) of the button. But you need not worry about these coordinates nor the inner structure of the *it* variable—you merely follow what seems a logical English command.

USING HYPERCARD

In the forthcoming installment of Using *HyperCard*, we'll examine how *HyperCard* creates HyperTalk scripts automatically with its linking function—and how you can write your own similar linking scripts. And, of course, we'll look at more of the best stackware available. ■

SOFTWARE GUIDE

Welcome to FAMILY & HOME-OFFICE COMPUTING's Software Guide. The following table relates to the review charts that follow. It lists the various types of computers as designated under "hardware requirements" (and other hardware designations in this issue), the models included under each designation, and the minimum memory requirement (unless otherwise indicated).

DESIGNATION	MODELS	MINIMUM MEMORY
Amiga	500, 1000, 2000	512K
Apple	II, II Plus, IIe, IIc, IIgs (in IIe/c mode)	48K
64K Apple	II Plus, IIe, IIc, IIgs (in IIe/c mode)	64K
128K Apple	IIe, IIc, IIgs (in IIe/c mode)	128K
Apple IIgs	IIgs only	512K
Atari	800, 600XL, 65XE, 130XE	48K
Atari ST	520ST, 1040ST, MegaST	512K
C 64/128	C 64, C 128 (in 64 mode)	64K
C 128	C 128 only	128K
IBM PC	PC, XT, AT, PS/2, and compatibles	256K
Macintosh	128K, 512K, Plus, SE, II	128K
Tandy CoCo	2, 3	64K

Please note: All Apple designations (except for IIgs) include compatibles such as the Laser 128 or Franklin 2100. Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility. Any additional hardware listed is required unless noted as "recommended" or "optional." In many cases, "2nd drive" refers to either a floppy-disk drive or hard-disk drive. **KEY:** **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions that accompany a program. **EH** = Error handling, the software's capacity to accommodate errors made by the user. **PS** = Play system (in the Entertainment reviews), the quality of the game's design and its playability. **GQ** = Graphics quality, evaluated in light of each model's graphics capabilities. **EU** = Ease of use after the initial learning period; varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

BUSINESS & PRODUCTIVITY

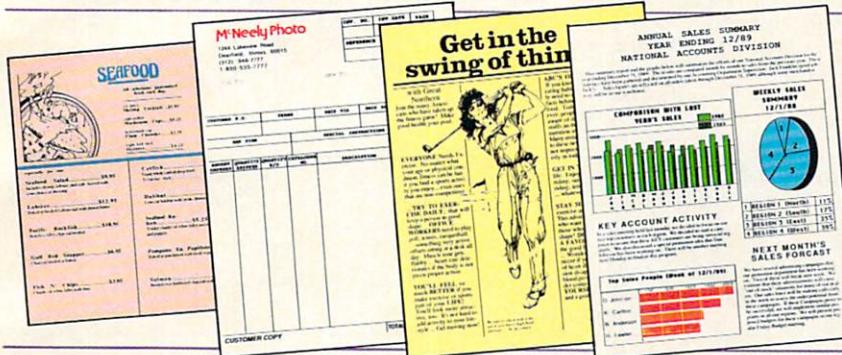
Title Publisher Price	Brief description	Hardware required	Ratings						
			CP	O	D	EH	GQ	EU	V
KEYNOTES WRITER'S HANDBOOK Digital Learning Systems 4 Century Drive Parsippany, NJ 07054 (201) 538-6640 \$30 ©1987	If you often have questions about grammar, punctuation, and the like, here's an on-line writing tool to consider. But unlike style checkers, this acts as a reference only and does not proofread your text. While it covers a lot, it is not complete. —ROTTENBERG	Reviewed on 128K IBM PC. Also for 512K Macintosh.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
MEMORYMATE Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 492-3500 \$70 ©1987	Notepad database that not only allows you to search records by date or word, but also automatically display any record on the indicated reminder date. Works as a memory-resident or stand-alone program. Valuable for keeping track of bits of data.† —SUMMERS	IBM PC.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
MULTISCRIBE DESK ACCESSORIES StyleWare, Inc. 5250 Gulfton, #2E Houston, TX 77081 (713) 668-1360 \$40 ©1986, 1987	Works with the MultiScribe word processor to give you five on-line functions: calculator, clock, calendar, puzzle, and a control panel that helps you create macros (multiple keystrokes linked together) as keyboard shortcuts. Simple and inexpensive.† —SOLOMON	128K Apple. MultiScribe 2.0. Mouse optional. Clock card required for clock function.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★
MULTISCRIBE PICTURE MANAGER StyleWare, Inc. (see above for address and phone) \$40 ©1986, 1987	This add-on for MultiScribe lets you merge up to 15 graphics—from programs such as Dazzle Draw or MousePaint—anywhere in your text. You can even adjust the size and position of a picture after it has been added to a document. A good addition to the Apple II line.† —SOLOMON	128K Apple. MultiScribe 2.0. Mouse optional.	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★
QUICKEYS CE Software 801-73rd St. Des Moines, IA 50312 (515) 224-1995 \$100 ©1987	With this marvelous macro program that's always accessible, you can set up hundreds of keyboard shortcuts for inserting text, choosing menu items, clicking and moving the mouse, running all your programs, and tons more. Easy and indispensable.† —HALLERMAN	512K Macintosh. System 4.1 or later.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	E	★ ★ ★ ★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-handling; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; **○** Poor; **★** Average; **★★** Good; **★★★** Very Good; **★★★★** Excellent; **N/A** Not applicable; **E** Easy; **A** Average; **D** Difficult; **CP** Copy protected, yes or no; **†** Longer review follows chart

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your layout or experiment—almost effortlessly!

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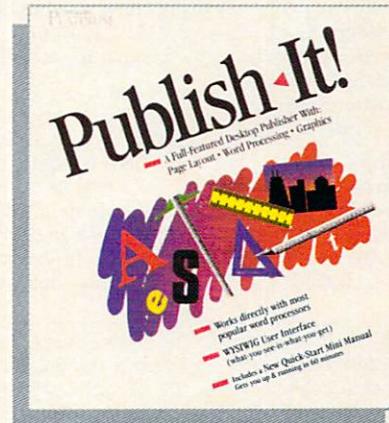
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Title Publisher Price	Brief description	Hardware required	Ratings						
			CP	O	D	EH	GQ	EU	V
WORDPERFECT FOR THE AMIGA WordPerfect Corp. 288 W. Center St. Orem, UT 84057 (801) 225-5000 \$395 ©1987	By fully utilizing the Amiga's icon-and-menu interface and multitasking environment, the publisher of the acclaimed MS-DOS and Apple II word processors has come up with another winner. I only wish I could switch fonts and insert graphics.† —SUMMERS	Amiga. 2nd drive recommended.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	N/A	A	★ ★ ★

EDUCATION & CREATIVITY

THE ADVANCED ART STUDIO Firebird Licensees, Inc. 71 N. Franklin Tpke. Waldwick, NJ 07463 (201) 444-5700 \$40-\$45 ©1987	Paint program with a decent set of features—such as magnify mode, font editor, and changing fill patterns—but very awkward to use. For instance, all printers but one need to be configured by entering Escape codes. Only for the adventurous. —HUNT	Reviewed on C 64/128. Also for Atari ST. 2nd drive; mouse, joystick, KoalaPad optional.	N	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★	A	★
DRAW PLUS Activision, Inc. 2350 Bayshore Parkway Mountain View, CA 94043 (415) 960-0410 \$90 ©1987	Precision drawing program that integrates text and color with grids and rulers for making graphs, floor plans, forms, architectural drawings, diagrams, and the like. The tools provided are comprehensive, making it easy to use, but requiring some time to learn. —FRANK	Apple IIgs. 3.5-inch drive.	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	E	★ ★ ★
FOOD FOR THOUGHT Sunburst Communications 39 Washington Ave. Pleasantville, NY 10570 (914) 769-5030 \$65 ©1987	To be healthy, you have to know what you eat. By playing the Food Challenge games (such as "find foods low in saturated fat") and using a database of more than 300 foods (which can be expanded), families can plan their real-life meals. Not catchy, but useful. —ELTGROTH	64K Apple. Color monitor, printer optional.	Y	★ ★ ★ ★	★ ★ ★ ★	★ ★ ★ ★	★ ★	E	★ ★
LOGOWRITER STARTER SET Logo Computer Systems, Inc. 1000 Roche Blvd. Vaudreuil, Quebec, Canada J7V 6B3 (514) 455-5636 \$129 ©1987	What's part programming language, part word processor, and part design software, all packed into a wonderful learning environment for children? It's <i>LogoWriter Starter Set</i> . For encouraging creativity in drawing, writing, and thinking.† —SOLOMON	Reviewed on 128K Apple. Also for 64K Apple, C 64/128, IBM PC. Color monitor recommended.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	E	★ ★ ★
PHYSICS Broderbund Software 17 Paul Drive San Rafael, CA 94903 (415) 492-3500 \$100 ©1987	Like Broderbund's <i>Geometry</i> program, <i>Physics</i> brings its subject to graphic life with a complete study course. From the properties of light to Newton's laws, tutorials and problem sets—accompanied by moving diagrams—help make learning better. —ELTGROTH	512K Macintosh. 2nd drive (800K minimum) required.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	E	★ ★ ★
RSVP Blue Lion Software 90 Sherman St. Cambridge, MA 02140 (617) 876-2500 \$30-\$40 ©1987	Good manners are the name of this game, but it's harder than you think. You select one of eight careers, then try to behave properly in both domestic and foreign situations. Good for learning, but not for reference, since you can't look up specific situations. —SUMMERS	Reviewed on IBM PC. Also for 128K Apple, C 64/128, CGA, EGA, Hercules (IBM).	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	E	★ ★ ★
THINK QUICK! The Learning Company 6493 Kaiser Drive Fremont, CA 94555 (415) 792-2101 \$50 ©1987	It sounded like some standard magical adventure to my son and his friend. What they didn't notice, lurking behind the dungeon door, was educational software that teaches children (ages 7-14) how to unravel problems through reasoning.† —SUMMERS	Reviewed on 64K Apple. Also for IBM PC. Color monitor, joystick optional.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	E	★ ★ ★
TOPDRAW StyleWare, Inc. 5250 Gulfton, #2E Houston, TX 77081 (713) 668-1360 \$90 ©1987	Similar to <i>Draw Plus</i> (see above). <i>TopDraw</i> offers icon-based drawing tools, 16 colors at a time, and color printing with an Image-Writer II. <i>TopDraw</i> 's manual is superior, including a step-by-step tutorial. Helps you create professional-looking documents. —ZORNBERG	Apple IIgs. 3.5-inch drive.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★	A	★ ★ ★

RATINGS KEY • Overall performance; D Documentation; EH Error-handling; GQ Graphics quality; EU Ease of use; V Value for money; O Poor; ★ Average; ** Good;
*** Very Good; **** Excellent; N/A Not applicable; E Easy; A Average; D Difficult; CP Copy protected, yes or no; † Longer review follows chart

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ENTERTAINMENT

Title Publisher Price	Brief description	Hardware required	Ratings							
			CP	O	D	PS	GQ	EU	V	
DEF CON 5 Cosmi, Inc. 415 N. Figueroa St. Wilmington, CA 90744 (213) 835-9687 \$20-\$25 ©1987	Playing this game is like participating in a U.S. Army war game, as gamers defend the country against nuclear attack in multi-screen arcade action. The constant movement between weapons systems and map and control screens tests even experienced joystick jockeys. —DELSON	C 64/128. Joystick.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
GAUNTLET Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$35-\$50 ©1985, 1987	When compared to the original coin-op <i>Gauntlet</i> , this version pales. But the sword-and-sorcery quest is saved by the multiplayer mode, where players must cooperate to collect treasures and eliminate monsters (including death itself). —DELSON	Reviewed on C 64/128. Also for Atari ST. Joystick(s).	Y	★ ★	★ ★	★ ★	★ ★	A	★ ★	
HIGH SEAS Gardé 8 Bishop Lane Madison, CT 06443 (203) 245-9089 \$50 ©1987	As detailed a simulation of sailing and combat for tall ships as I've ever seen, although it's a slow-moving event requiring patience to fully appreciate. Joystick controlled and menu-driven, it's smooth moving as well. With a construction-set mode.† —DELSON	Reviewed on C 64/128 ¹ . Also for 64K Apple ² . Joystick recommended.	N ¹ Y ²	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
THE LAST NINJA Activision, Inc. 2350 Bayshore Parkway Mountain View, CA 94043 (415) 960-0410 \$35 ©1987	Beyond first-rate graphics and other small elements, such as gathering items for your travels and avoiding combat by fooling your adversaries, there's not much that sets this apart from dozens of different martial arts games. —DELSON	C 64/128. Joystick.	Y	★ ★	★ ★	★ ★	★ ★	A	★ ★	
MANIAC MANSION Lucasfilm Games, dist. by Activision, Inc. (see above for address and phone) \$35 ©1987	In this maniacally devious and ridiculously silly game, you must rescue your girlfriend from Dr. Fred's mansion. Combines an absurd story line with an innovative play system to create one of the best graphic adventures I've seen around.† —LANGENDOEN	Reviewed on 128K Apple. Also for C 64/ 128. Joystick.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
NORD AND BERT COULDN'T MAKE HEAD OR TAIL OF IT Infocom 125 CambridgePark Drive Cambridge, MA 02140 (617) 492-6000 \$35-\$40 ©1987	Or maybe they couldn't make Ted or Hail of it—one never knows when playing this text adventure that's stuffed to the gills with spoonerisms, clichés, idioms, puns, and other verbal trickery. It's an extremely amusing game that really sets you a-musin'. It won't leave you bored and inert. —LANGENDOEN	Reviewed on 128K Apple. Also for Amiga, Atari ST, C 64/128, 128K IBM PC, 512K Macintosh.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★ ★	
PAPERBOY Mindscape, Inc. (see above for address and phone) \$35 ©1984	Object: Ride your bicycle through the neighborhood. Deliver newspapers to your regular subscribers. Avoid hazards such as stray tires or menacing dogs. Result: A game good enough for dedicated arcade fans, but otherwise too repetitive. —DELSON	C 64/128. Joystick.	Y	★ ★	○	★ ★	★ ★	A	★	
PINBALL WIZARD Accolade, Inc. 20813 Stevens Creek Blvd. Cupertino, CA 95014 (408) 446-5757 \$35-\$40 ©1986, 1987	Playing pinball with this simulation is fairly straightforward; the movement of the ball is a little unnatural, yet smooth. The highlight here is an elaborate construction set with not just the usual parts—bumpers and flippers, say—but obstacles and decoration, too. —OSGOOD	Reviewed on Atari ST. Also for IBM PC. CGA, EGA, Hercules (IBM). Joystick.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
ROADWAR EUROPA Strategic Simulations, Inc. 1046 N. Rengstorff Ave. Mountain View, CA 94043 (415) 964-1353 \$40-\$45 ©1987	In this sequel to <i>Roadwar 2000</i> , your challenge is to defuse five nuclear bombs that terrorists have planted across Europe and find the evildoers as well. Gather intelligence, increase your gang, and fight battles—but the graphics and sound are extremely weak. —DELSON	Reviewed on Apple. Also for Amiga, Atari ST, C 64/128, IBM PC.	Y	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★	
SANXION Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$20 ©1987	The tradition continues—spaceships versus the aliens. The superb 3-D color graphics may be exceptional, but that's about all. There's not much more to do beyond firing your weapons and steering through swarms of enemies attacking your planet. —DELSON	C 64/128. Joystick recommended.	Y	★	★	★	★	A	★	

RATINGS KEY **O** Overall performance; **D** Documentation; **PS** Play system; **GQ** Graphics quality; **EU** Ease of use; **V** Value for money; **○** Poor; **★** Average; **★★** Good; **★★★** Very Good; **★★★★** Excellent; **N/A** Not applicable; **E** Easy; **A** Average; **D** Difficult; **CP** Copy protected, yes or no; **†** Longer review follows chart

SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 62 for information such as copy protection and addresses of software publishers.

BUSINESS & PRODUCTIVITY

MemoryMate

HARDWARE REQUIREMENTS: IBM PC.

PUBLISHER: Broderbund Software

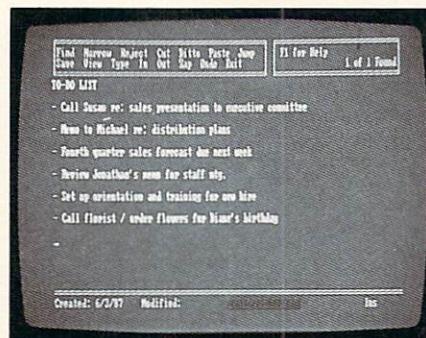
PRICE: \$70

MemoryMate combines the convenience of a memory-resident, on-line notepad with the organizing capabilities of a database. After you call up *MemoryMate*, you can type up to 60 lines of text in any format. Each page then becomes a *MemoryMate* record. Simple word processor-like functions include cut or duplicate and paste, delete and undo, word wrap, and tabs. When you save the record, it's automatically stamped with the current date, enabling you to select records by the dates on which they were created or modified. If you also indicate a reminder date, *MemoryMate* will automatically display that record on the specified day.

There's no way to sort *MemoryMate* records, since there are no fields. However, you can search the database for any date, word, or combination as long as the item you're searching for isn't longer than 73 characters. Search commands can include the logical "and" and "or" as well as relational commands such as "greater than" and "equal to."

MemoryMate accepts commands entered from its moving-bar menu or directly from the keyboard in the form of CONTROL key-letter key combinations. If you already work with a keyboard-enhancing program that employs the same commands, you can configure *MemoryMate* to run using only the bar menu. It was annoying that I couldn't leave *MemoryMate* by pressing ESCAPE, as I do with most memory-resident programs; since pressing ESCAPE transfers you between the current record and the menu, you have to press CONTROL-E(xit) to quit.

MemoryMate can be used as a stand-alone rather than a memory-resident program if you prefer. In either case, it uses about 82K of RAM. The program is more efficient when



the database is kept on a hard disk, but if you use *MemoryMate* with floppy disks, it reminds you each time you have to change data disks.

MemoryMate will not replace a word processor or database. However, its ability to find any bit of text anywhere within its files makes it a valuable accessory for applications that just don't fit ordinary formats.

—TAN A. SUMMERS

MultiScribe Desk Accessories MultiScribe Picture Manager

HARDWARE REQUIREMENTS: 128K Apple.

PUBLISHER: StyleWare, Inc.

PRICE: \$40 each

If you need sophisticated-looking printouts with an Apple IIe or IIc, you want to consider *MultiScribe 2.0* (or the newer version 3.0)—a mouse-controlled word processor with pull-down menus and various fonts (*version 1.0 was reviewed in the February 1987 issue*). As Macintosh-like as *MultiScribe* appears to be, up to now two important elements were missing: the ability to insert graphics into your text and a series of desk accessories. That's why I welcomed the versatility of two add-ons—the *Picture Manager* desk accessory and a separate collection of tools called *Desk Accessories*.

Few programs for the Apple II let you add graphics to word-processed documents. *Picture Manager* changes that.

Installing it into *MultiScribe* is a straightforward task. Then, when you boot *MultiScribe*, the *Picture Manager* option appears under the Apple menu. Using *Picture Manager* is equally straightforward. Create your document as usual—with up to 10 fonts, five point sizes, and 12 typestyles—and format the text. When you're ready to add graphics (up to 15 are allowed per document), insert a disk with the picture(s) you want, select *Picture Manager* from

the Apple menu, and choose the graphics file from a scrolling list.

Select the portion of the graphic you want and copy it to the clipboard; switch back to your document, and paste the graphic where it's needed. You can adjust size and position or pull down the Apple menu again and edit the graphic with the *MultiScribe Font Editor*.

With the *Desk Accessories* package, you get five on-line functions. Add a clock, calculator, and calendar to your Apple menu for greater efficiency and a puzzle for break time. There's also a control panel that lets you change the pitch of your Apple's beep, alter the speed of your cursor's blink, and switch from standard to inverse display. In addition, the control panel lets you create macros (multiple keystrokes linked together) that help automate writing with *MultiScribe*. For instance, when writing letters, I use it to print my name, title, and address at the press of a keystroke.

I thought the 256-year calendar—that quickly displays any month and offers a daily notepad for entering memos and reminders—was particularly useful. List everyone's birthdays and anniversaries for the next 10 years and relax; you'll never be in the doghouse again. In addition, you can copy the contents of your notepad to other programs or bring text from other programs.

If your family or business needs an easy-to-use writing and desktop-publishing system that gives you great-looking pages on an Apple IIe or IIc, *MultiScribe* along with the *Picture Manager* and *Desk Accessories* will do the job. —GWEN SOLOMON

QuicKeys

HARDWARE REQUIREMENTS: 512K Macintosh.

PUBLISHER: CE Software

PRICE: \$100

Computers promise to make repetitive work easier by automating it. Yet, ironically, controlling a computer often entails repetitive actions, even when working with a machine that's generally as simple to use as a Macintosh. For instance, before I can write a new document with *MacWrite*, I need to pull down one menu to access my favorite font, go to a second menu to make that font the desired point size, and then drag the tab marker across the ruler for normal paragraph indents.

SOFTWARE REVIEWS

There's another compromised promise. Many say that using a mouse makes operating a computer easier. While that's certainly true most of the time, there are still too many instances when experienced typists would find jobs went faster if they kept their hands on the keyboards, when moving to the beginning or end of a document, for instance. Yet many Macintosh programs give you no option between mouse or keyboard. How frustrating!

But no more compromising for me. I've taken tasks like the ones just mentioned, along with literally hundreds of others, and automated them with the *QuicKeys* macro program. A *QuicKeys* macro is a computer procedure that strings together blocks of text (up to 71 characters), a series of commands (such as menu choices), mouse movements (clicking and dragging), or some combination of the three (called a *sequence*) into a shortcut. I invoke any *QuicKeys* shortcut with a single keystroke combination. For instance, I press CONTROL-W to run my word processor, CONTROL-E to run *Excel*, and OPTION-UP ARROW to move to the top of any document. Since *QuicKeys* lets me combine the COMMAND, CONTROL, OPTION, and SHIFT keys with any of the other keys, I have hundreds of potential macro keystrokes. And I don't have to remember all of them, either, because a Quick Reference card appears on-screen if needed.

QuicKeys macros are created in "sets." Not only can each program have its own set of shortcuts, but there's also a set of macros (called *Universal*) that can be used in every program. By crossing over among programs, the *Universal* set lets you create a unity of commands for your work, which makes controlling the computer much easier. For example, while some programs let me press COMMAND-P to print a document, many others don't. However, I've created a *Universal* macro that lets me use just that keystroke combination to start printing out—no matter what the program.

The documentation is the one weak link in this package. All the basic information is there, but I thought it was poorly organized and therefore confusing. I couldn't find specific information right away when I needed it, so I learned a lot by trial and error. Yet since the pro-

gram itself is so understandable, that wasn't a major obstacle.

There are scores of other uses for *QuicKeys* that I haven't room to mention. Suffice it to say that *QuicKeys* has quickly become an almost indispensable program in my collection. It only adds to the efficiency and pleasure of my computing, without taking a thing away.

—DAVID HALLERMAN

WordPerfect for the Amiga

HARDWARE REQUIREMENTS: Amiga.

PUBLISHER: WordPerfect Corp.

PRICE: \$395

At last—a serious word processor for the Amiga. Not just a translation from the popular MS-DOS and Apple II versions of *WordPerfect*, this program fully utilizes the Amiga's multitasking environment and graphical user interface.

WordPerfect is packed with performance and features. For example, there's an "undelete" command that remembers up to three erasures. You can create and print text in up to five columns, using either a parallel format that's useful for translations and lists, or a newspaper style in which the text automatically starts at the top of the next column when you reach the bottom of the page.

In addition to text entry and editing, *WordPerfect* includes a 115,000-word spelling checker that quickly finds possible alternative spellings by using a sophisticated method that recognizes common typing and spelling errors. There's also a useful thesaurus capable of finding synonyms and antonyms for about 40,000 words.

Producing high-quality printouts is an important priority with *WordPerfect*. The program conserves your valuable time by printing in the background while you continue with other word-processing tasks. You can queue a print job, so it isn't necessary to constantly interrupt your work while it's being processed.

Filling out preprinted forms—a tricky chore that's usually left for the typewriter in the back room—is possible with *WordPerfect*. You can use its merge feature to create form letters. Even complex chores, such as the marking and placement of footnotes or endnotes, become less intimidating with *WordPerfect*. The program makes you decide where to break a footnote if the entire note can't be placed on the same page as

the footnote reference, but everything else is automatic.

If *WordPerfect for the Amiga* has a weakness, it's a lack of artistic flair. It doesn't offer a graphic print mode that provides fonts other than those supported by your printer, can't print in color, and won't let you add pictures to your text. Desktop publishers will still have to do some cutting and pasting if they want to add visual zest to a page. However, *WordPerfect* is a professional-quality word processor that comes with a professional-quality price tag—but it's worth every penny. If word processing is part of your home business or if your household includes a scholar or writer, you probably can't afford not to look at *WordPerfect*.

—TAN A. SUMMERS

EDUCATION & CREATIVITY

LogoWriter Starter Set

HARDWARE REQUIREMENTS: 64K Apple, 128K Apple, C 64/128, IBM PC.

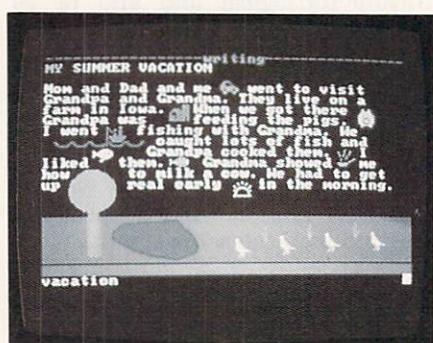
PUBLISHER: Logo Computer Systems, Inc.

PRICE: \$129

Q: When is a turtle not a turtle?

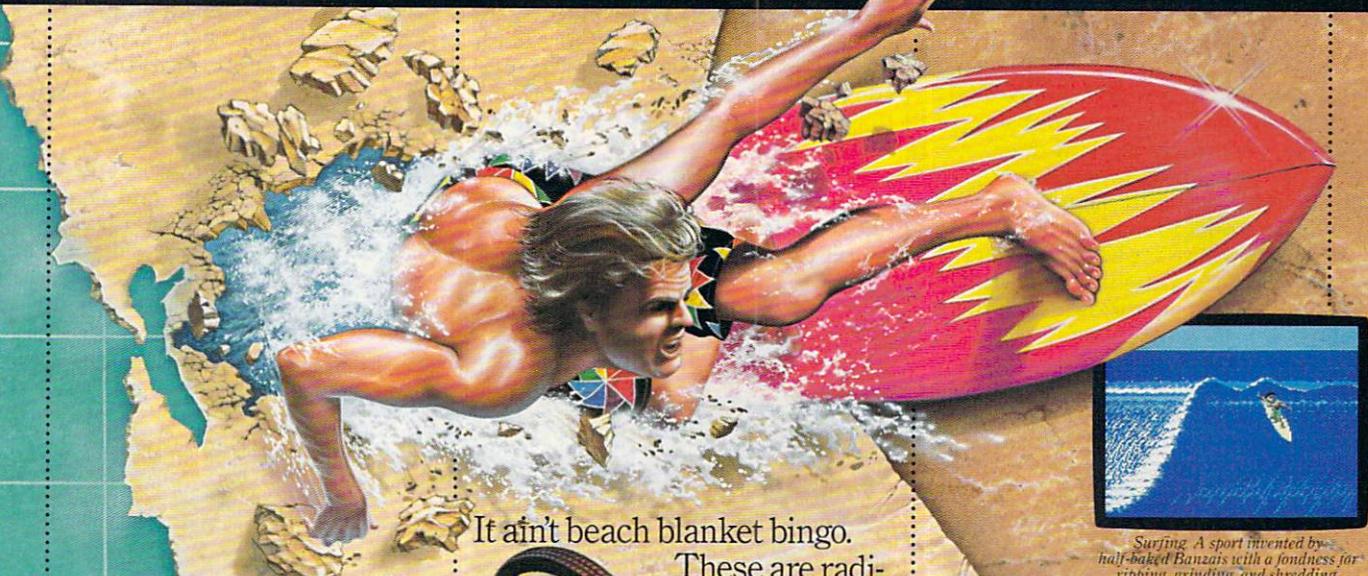
- A:**
1. When it's the cursor in Logo.
 2. When it can take on other shapes.
 3. When it can become four turtles.
 4. All of the above.

With *LogoWriter*, all of the above are true. And there's lots more that's new and exciting for children to learn and enjoy.



Logo is a programming language and learning environment designed with an educational philosophy in mind. With any version of Logo, children command the turtle (Logo's cursor) to move forward and back and turn left or right. Where the turtle leaves tracks, beautiful designs and patterns result, and children discover geometric concepts.

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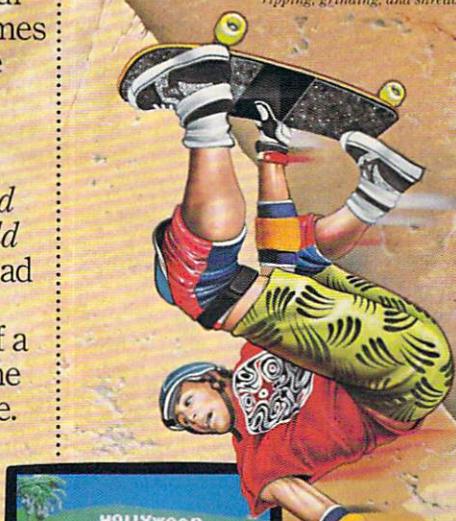
Surfing. A sport invented by half-baked Banzais with a fondness for ripping, grinding, and shredding.



BMX Where wheelies are the breakfast of champions. And everyone else eats dirt.

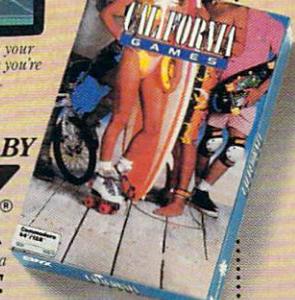


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SOFTWARE REVIEWS

LogoWriter offers several advantages over previous versions. Children can turn the turtle—which now looks like a turtle instead of a triangle—into another shape. Then the designs will be drawn with, say, a helicopter, flower, cat, or truck. Children can stamp this new cursor's shape onto the screen and even shade part of the screen with many copies of the selected shape. The turtle can become four turtles. These can become four other shapes that children manipulate around the screen separately or all at once.

Children could always print words and sentences with Logo, but now they can label their designs and pictures anywhere on the screen or write stories with a built-in, 40-column word processor and then draw illustrations for their work.

They can create special projects, too—anything from a party invitation to a full-fledged school report. One suggestion is an adventure story where the reader chooses the ending. Children write the entire story complete with plot branches for selecting. They draw the pictures to go with each screen, and then write the Logo program to display the pages in the sequence they like best.

Documentation and help are first class. There are an on-disk tutorial, a reference guide, keyboard stickers, and a booklet and activity cards to help everyone get the most from *LogoWriter*.

For children, *LogoWriter* offers incredible ways to develop creativity in drawing, in writing, and in learning. For parents, *LogoWriter* offers many activities they can enjoy with their children; you won't be able to tear yourselves away from the screen. This new program has so much to offer, that it is one of the best ideas in educational computing.

—GWEN SOLOMON

Think Quick!

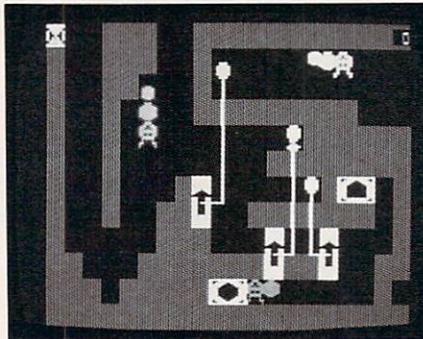
HARDWARE REQUIREMENTS: 64K Apple, IBM PC.
PUBLISHER: The Learning Company
PRICE: \$50

Deep in the dungeon lurks the dragon. Alone except for the magical knight you created from treasures found along the way and armed only with your wits, you must expel the dragon. Mystical flowers that grow in the darkness protect you from the

slime worm's maw, but there are so few flowers, so many worms!

Think Quick! sounded like a standard dungeon adventure to our son, Howard, and his friend Brent. They didn't notice that it's really educational software that teaches children to unravel problems through reasoning. The boys had to solve a geometric puzzle to get valuable objects, some of which they placed in a cauldron to be magically assembled into the knight. Other objects formed a map showing passages into additional chambers.

Getting objects wasn't as easy as the boys expected, since they had to decide quickly which doors to open



in what order while dodging the ever-present slime worms. They learned to duck into their secret hideout to escape worms and check maps. No one dies in *Think Quick!*, but the boys frequently ran afoul of the worms, losing precious game time. Although the game is suggested for children 7 years and older, Brent's 6-year-old sister, Victoria, frequently first came up with the best route through a particular part of the dungeon.

Think Quick! thoughtfully provides a practice mode that teaches players the skills they'll need. Children who don't work well under pressure can play without the timer until they feel more confident. Experienced players can progress to a more challenging advanced mode. Howard and Brent were delighted to learn that they could even create their own dungeons and puzzles. Brent's mother liked the parents' and teachers' guide containing suggestions for related games and activities to be played away from the computer. Both an engaging game and a smart teaching tool, *Think Quick!* earns high marks on all counts.

—TAN A. SUMMERS

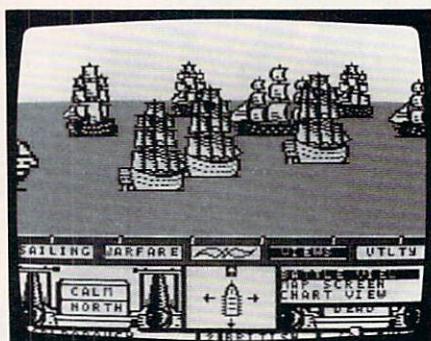
ENTERTAINMENT

High Seas

HARDWARE REQUIREMENTS: 64K Apple, C 64/128.

PUBLISHER: Gardé
PRICE: \$50

In the great age of sail (1600–1850), it was said that wooden ships carried iron men into battle. No previous battles at sea rivaled the sight of two or more enormous ships, their dozens of sails filled with wind, tacking across the waves. And when their huge cannons roared—belching smoke that blinded and deafened the gun crews, hurling balls that weighed as much as 64 pounds across miles of open ocean—it was said to be the most awesome sight one would ever witness.



Now Ralph Bosson—whose pioneering *Under Fire* and *Blue Powder*, *Grey Smoke* brought new detail to the field of land war gaming—has turned his attention to water with *High Seas*. This new program is as detailed a simulation of sailing and combat for tall ships as I've ever seen, although it is a slow-moving game requiring patience if you're to fully appreciate it.

You face a variety of supplied sea engagements, from two-ship actions to full-fledged fleet battles. And for those with a taste for creativity, there are ship and scenario construction sets that let you build your own ships or fleets and face them off against human or computer opponents.

High Seas is not for arcade fans. It takes time to learn to command a single small ship: setting courses, changing sails, and directing gun crews in battle. But this is nothing compared to your ultimate goal: to issue orders to an entire fleet.

You select options—such as setting game parameters and issuing

SOFTWARE REVIEWS

commands—with a joystick or the keyboard from a menu-driven system. The game can be played in turns or as a real-time simulation, and there are various ways one can handicap experienced players to give newcomers a fighting chance at victory. The game's graphics are colorful and clear, offering 360 degree views from deck level, overhead views of the entire map board, and a "zoom" onto particular battles in progress. *High Seas* is complex but rewarding.

—JAMES DELSON

Maniac Mansion

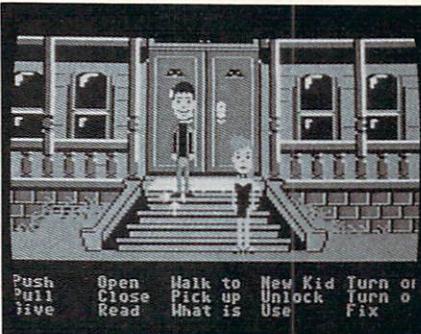
HARDWARE REQUIREMENTS: 128K Apple, C 64/128.

PUBLISHER: Lucasfilm Games, dist. by Activision

PRICE: \$35

Maniacally devious. Deviously maniacal. Strangely compelling. Ridiculously silly. These are the outstanding hallmarks of *Maniac Mansion*, one of the most innovative graphic adventures around.

Twenty years ago a meteor crashed into the backyard of Dr. Fred's mansion. Since then, strange and mysterious things have occurred. The



most recent event is the kidnapping of a local university student, Sandy. As Dave, Sandy's boyfriend, you must sneak into the mansion and rescue her. Fortunately, you can bring two of your six friends with you—the choice is up to you. Should one be Wendy, who aspires to be a novelist? Or perhaps Bernard, the nerd among nerds? Each has his or her own abilities, and the adventure can be solved by any combination. The question is how.

The play system is similar to *King's Quest's*, where you see your character on-screen and move him or her about in an arcade fashion. Although you must use a preset list

of commands (such as open, read, or pick up), which can be frustrating at times, you can switch control among the three would-be rescuers at any time. This allows for a certain amount of teamwork, which creates many options that are missing in a single-character adventure.

The plot line borders on the absurd, but is exceedingly playable. Everything makes sense in its own way—although what exactly do you feed a giant disembodied green tentacle? And where do small furry animals and microwaves fit in? (Hint: You do not put the small furry animal in the microwave.) Postal fraud? Obscene phone calls? Chain saws?

Maniac Mansion is almost flawless. The "main" problem is that it can be all too easy to choose the wrong command in a tight situation if you press the joystick button at the wrong place. However, this is quickly remedied with patience and practice.

Maniacally silly. Deviously compelling. Strangely devious. Ridiculously maniacal. These are the markhalls of *Maniac Mansion*. Or something like that. It makes sense "in its own way."

—DAVID LANGENDOEN

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No wiring necessary (just plugs together). Hook-up diagram included. Incl.: Keyboard, 1 cassette digital data drive, 2 game controllers, power supply, & one cassette. Capable of running CP/M, has built-in word processor. Item #7410 Complete - \$99.00

ADAM 5 1/4" DISK DRIVE



Gives your Adam fast, reliable data storage & retrieval. Can hold up to 160K bytes of information. Uses industry-standard SS/DD disks. Connects directly to your Adam memory console. Comes w/disk drive power supply, Disk Manager disk and owner's manual. Mfr - Coleco, model 7817. Item #12830 Like New - \$199.00

ADAM Accessories . . .

Data Drive - Item #6641 \$19.95

Printer Power Supply - Item #6642 \$14.95

ASCII Keyboard - Item #6643 \$19.95

Controllers (Set of 4) - Item #7013 \$9.95 RFE

Adam Cassettes - (Consisting of Smart Basic, Buck Rogers & blank cassette.) Item #7786

BAKER'S DOZEN - \$19.95

Adam Link Modem (Software incl.) - Item #12358 \$29.95

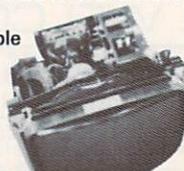
Auto-Dialer Address Book - Item #12365 \$19.95

Disk Drive Power Supply - Item #14603 \$14.95

Adam Daisy Print Wheel - Item #13305 \$3.95

Adam Ribbon Cartridge - Item #13306 \$3.95

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Perfect for text, CAD, & other graphics applications. Scanning frequency to 25KHz. Resolution: 720 x 350 max. Input: 110/220V, 50/60Hz., 80W. (Hook-up diagram incl.) Mtd. in metal housing. Mfr. #14-GZF2. Item #14864 \$179.00 New

15 Mb 5 1/4" FULL HT. HARD DISK DRIVE



(IBM® PC/XT Compatible)
Removed from working equipment. Tested & formatted. Mfr - CMI model CM5619. Item #14511 \$199.00

Item #10150 \$89.00

10 Mb, 5 1/4", HALF HT. HARD DISK DRIVE



(IBM® Compatible)
Shock mounted, high speed, low power. Mfr - Tandon TM252. Item #13250 \$159.00
Controller Card for above. Item #10150 \$89.00

5 1/4" FULL HEIGHT DISK DRIVES —

48 TPI (IBM® Compatible)
DS/DD, 80 Track
Tandon #TM100-2 or equiv.

Item #7928 \$79.00 New
2 for \$150.00 New

48 TPI (TRS80/Zenith/Xerox
800 Comp.) DS/DD, 40 Track
Shugart #450. Item #1892. \$79.00; 2 for \$150.00

48 TPI, SS/DD, 40 Track
Shugart #SA400. Item #1895. \$39.50; 2 for \$75.00

96 TPI, DS/Quad Density
CDC #9409. Item #1893 \$89.00

5 1/4" 1/2 HT. DISK DRIVES

IBM® AT Compatible)
48/96 TPI, 1.2 Mb
Double side, high density: 160 tracks. Mfr - Panasonic #JU-1675
Item #10005 \$109.95 New
96 TPI, (DOS 3.2 Compat.)
Double side, quad density.
Mfr - Tandon TM55-4
Item #1904 \$79.00
2 for \$150.00

12", HIGH RES. TTL MONITOR



12 VDC/110 VAC (w/built-in power supply). Green phosphor. Schematic supplied. Mfr - Capetronic #DS-1030. Item #6811 \$19.95 New

Item #10960 \$7.95 RFE

1/2" Standard: contains 7 metal blades.

Mfr - Rotron #SU2A1

Item #5970 \$7.95 New

115 VAC 27 CFM MINI FANS

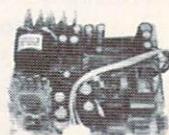


50/60Hz.; 12W.
Low noise level fans, can be mounted for blowing or exhaust.

1" Thin: contains 9 plastic blades
Dim.: 3 1/8" sq. x 1" deep
Mfr - Tobishi #U9201B

Item #15756 \$19.95 New

SWITCHING POWER SUPPLY

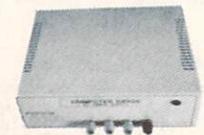


DC Output: -5V @ .5A
+24V @ 1.0A
+5V @ 8.6A

Input: 115/230 VAC, 50/60 Hz.
Dim.: 7 1/2" W x 13 1/4" H x 6 1/4" D
Mfr - Xerox #105S0441

Item #15756 \$19.95 New

COMPUTER GRADE POWER SUPPLY



Other uses - runs CB & car radios. Comes ready to plug in!

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+5V @ 3 amp.
+12V @ 6 amp.

Input 115V/60Hz. Dim.: 9 1/4" W x 3 3/4" H. (Rubber ft. incl.)

Item #9501 \$24.95 New

COMMODORE CARTRIDGES

C-64

Consists of 8 asstd. cartridges, incl.: Number Nabber, Star Post, Radar Rat, Jupiter Land, Viduzzles, Golf, Dragon's Den, & ABC Voice. Item #13573

Set of 8 - \$39.95 New

C16 & + 4

Consists of 8 asstd. cartridges, incl.: Calc Plus, Script+, Jack Attack, Pirate Adventures, Atomic Miss, Strange Odyssey, Financial Advisor, & Logo. Item #13572

Set of 8 - \$29.95 New

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Item #15419 3 sets/\$14.95 New

MAGNIFYING LAMP



Multi position, 30°, completely adjustable swing arm w/3-way metal C-clamp. Has 4" diopter magnifying lens, w/ruler. Porcelain lamp socket, & on/off switch; uses up to a 60W bulb. Color: Beige. UL listed. Item #13136 \$24.95 New

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NEON TRANSFORMER (Hi-Voltage)

7300VAC
@ 5 Ma.
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Item #13147 \$39.95 New

Super Action Controller Set
Incl. Baseball cart.
Item #13148 \$39.95 New

Plug-In Power Supply
Incl. #1882 \$4.95 New

12V BATTERY PACK & CHARGER 12V @ 9.5Ah



Consists of: 2 solid gel cell batteries, 6V @ 9.5Ah ea. Connected in series by a fusible harness. Matching battery charger: 12VDC @ 800Ma. Perfect for battery-operated toys, robotics, solar storage, burglar & fire alarms, etc.

OA Dim.: 4 1/4" W x 5 1/4" H x 5 1/2" D
Item #14619 \$29.95 New

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42-key mech. keybd, 2K RAM, Rev. video, Z80A, 6.5MHz processor, ROM 8K BASIC, Graphics cap./sound/music, TV or monitor. Joystick input, 115 VAC, AC adapt., TV cable, & case cables. Runs tapes for Sinclair/Timex 1000/10X85. Mfr - Power 3000. (In orig. boxes.) Item #10336 \$29.95 New

Accessories . . .

★ 16K RAMPACK upgrade
Item #10337 \$9.95 New

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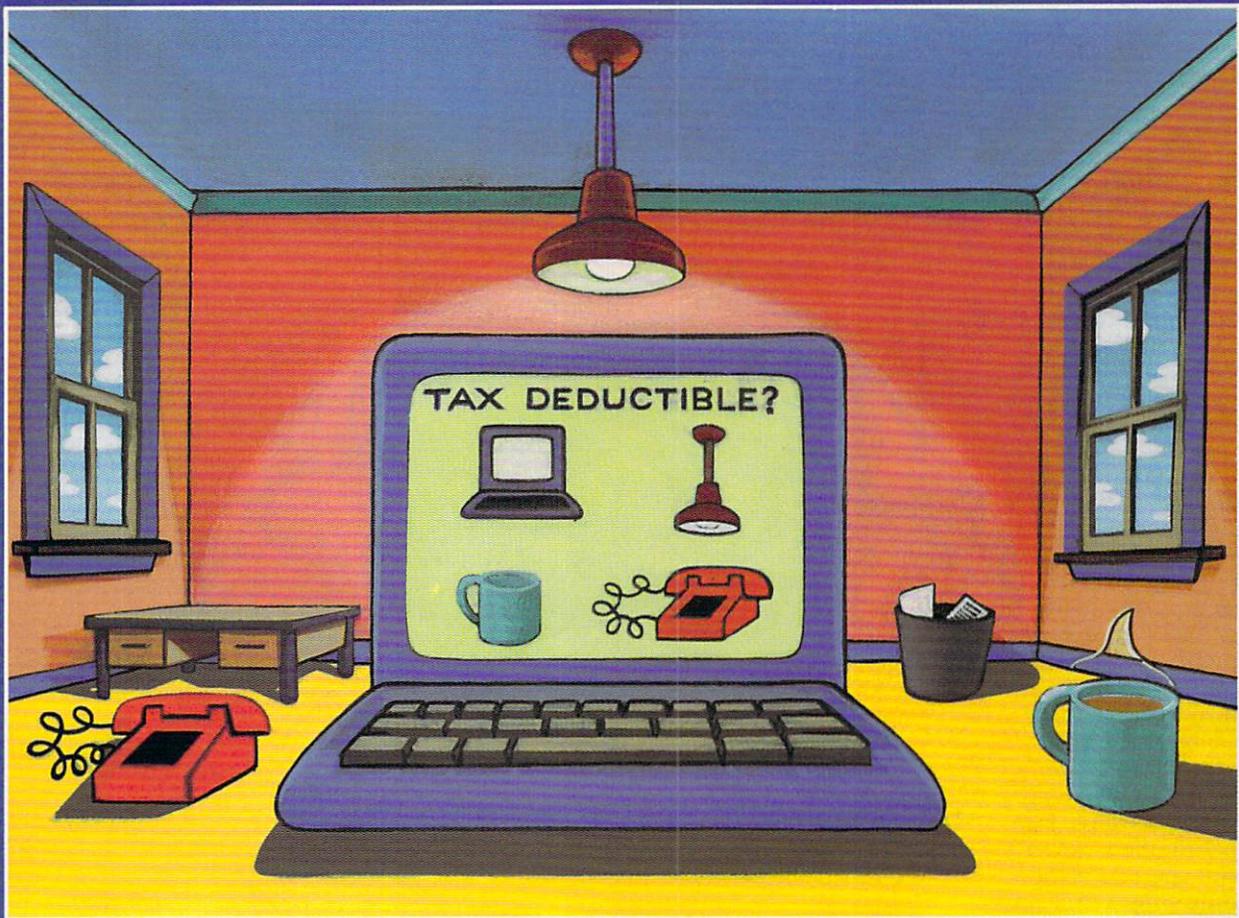
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THE PROGRAMMER



C O N T E N T S A N D C O V E R A G E

PRODUCTIVITY PROGRAM Page 74

Our *Home-Office Deduction Worksheet* will help you calculate the amount of your home-office expenditures that is tax deductible.

FYI Page 88

Announcement of our Instant Programmer Disk Series and "Programming P.S."

CONTEST Page 88

Win fame and fortune for your best original, short-short BASIC program!

PRESCHOOL PROGRAM Page 89

By matching *Shapes and Colors* on the screen, your preschooler is bound to beam.

Computers	Home-Office Deduction Worksheet	Shapes and Colors
APPLE FAMILY	★ P	★ C
APPLE II/PLUS/C/E/GS	★ P	★ C
MACINTOSH	★ P	★ C
ATARI 800/XL/130XE	★	★
COMMODORE 64/128	★ P	★ C
IBM PC FAMILY	★ P	★ C
IBM PC	★ P	★ C
IBM PC/r	★ P	★ C
IBM PS/2 MODEL 30	★ P	★ C
IBM PC COMPATIBLES		
BLUE CHIP	★ P	★ C
COMMODORE PC-10	★ P	★ C
EPSON EQUITY I	★ P	★ C
KAYPRO PC-10	★ P	★ C
LEADING EDGE MODEL D	★ P	★ C
PANASONIC FX-600	★ P	★ C
TANDY 1000 EX/HX/SXTX	★ P	★ C
VENDEX HEADSTART TURBO 888-XT	★ P	★ C
ZENITH Z148PC	★ P	★ C
TANDY COLOR COMPUTER		★ C

KEY: ★ Program in this issue for this computer. C Color monitor recommended. P Printer required.

HOME-OFFICE DEDUCTION WORKSHEET

TAKE THE TROUBLE OUT OF COMPUTING YOUR HOME-OFFICE DEDUCTION

BY PASQUALE M. CIRULLO AND MICHAEL ZAPLITNY, EA

If you have a home office or run a day-care center out of your home, you may be eligible to deduct a number of office expenses on your 1987 federal income tax return. Even parts of your rent and home repair payments may be deductible.

But computing the amounts of these deductions is not simple—especially with the changes introduced by the Tax Reform Act of 1986. And there's no tax form or schedule to lead you through the calculations.

Home-Office Deduction Worksheet can help you make sure you take deductions to which you're entitled. It leads you step-by-step through what can otherwise be an intimidating process. Just type in the BASIC program for your machine (or enter the appropriate values and formulas into your spreadsheet program—see "For Spreadsheet Users," right). Then answer the questions, supply the numbers asked for, and you can print a schedule supporting your deductions and telling you how to transfer the results to your return.

ARE YOU ELIGIBLE?

Not everyone with a home office is entitled to deduct home-office expenses. Was your office used "exclusively and regularly" for work? If you

information about your income and home-related expenses, such as mortgage interest, real-estate taxes, and utilities.

At that point you'll be able to print the worksheet on your printer. Then you can attach the worksheet to your return, or you can transfer the appropriate numbers to the specified forms, and file the worksheet with your tax records.

ACCURACY

Before you use the program or spreadsheet to calculate your actual deductions, first double-check to see whether you've made any typing errors, and then plug in the numbers from Figure 1: Sample Worksheet. If you do not get the same results, go back and check your work.

Although the program and spreadsheet do compute the deductions correctly when supplied with accurate data, they are intended solely to assist you with the calculations and cannot give tax advice. The Internal Revenue Service (IRS) has published a series of booklets (*see "Internal Revenue Service Publications of Interest"*) that may help you if you have questions. If you're still unsure how to treat an item of income or deduction, you should consult a tax adviser or the IRS.

EXPLANATION OF TERMS

Some of the terms used in the worksheet have special meanings that require further explanations:

For the convenience of the employer. This means

Figure 1: Sample Worksheet

Name: Ralph Norton	Year: 1987
	SSN: 123-45-6789
STATEMENT OF EXPENSES FOR BUSINESS USE OF HOME	
PART I: REQUIREMENTS	
Check one:	
• Self-employed	
Employee	
Day-care center	
If self employed or employee--	
Was area used exclusively and regularly for business?	
• Yes How many months was area used?	12.00
No	
If employee--Was the area used for the employer's convenience?	
Yes	
No	
If day care center--How many days was the area used?	
How many hours/day was the area used?	
PART II: BUSINESS PERCENTAGE	
Square feet used for business	500
Total square feet in home	2000
Business percentage (area % x time t)	25.00%
PART III: ALLOWABLE DEDUCTIONS	
1. Gross income (deduction limitation)	6915.00
2. Primary deductions	
a) Mortgage interest	8200.00
b) Real estate taxes	1050.00
c) Casualty loss	15000.00
3. Total of primary deductions	15750.00
4. Remaining deduction limitation	852.50
5. Secondary deductions	
a) Utilities	2200.00
b) Maintenance	950.00
c) Maintenance and repairs	500.00
d) Rent	.00
e) Other indirect expense	150.00
f) Direct maintenance and repair	300.00
g) Other direct expenses	.00
6. Total of secondary deductions	3000.00
7. Remaining deduction limitation	.00
8. Depreciation	475.00
9. Remaining deduction limitation	.00
10. Total amount of home-office expense carried over from last year	.00
11. Excess of gross income over allowable deduction	.00
12. Excess of allowable deductions over limitation	872.50
PART IV: Summary	
A. Transfer personal portion of primary deduction to Schedule A, if applicable. a) Mortgage interest	6150.00
b) Real estate taxes	787.50
B. Transfer total depreciation allowed to Form 4562	.00
C. Total allowable home-office expense for current year	3165.00
D. Total unused home-office expense (carry over to next year)	872.50
E. Transfer casualty loss to Form 4684	15000.00

PASQUALE M. CIRULLO is a technical editor for FAMILY & HOME-OFFICE COMPUTING; MICHAEL ZAPLITNY, a Certified Financial Planner, is also an Enrolled Agent (EA) who may represent taxpayers before the Internal Revenue Service. Zaplitny operates a tax practice from his home office in Brooklyn, New York.

that the space must be the focal point of business activities, and maintaining it must be a condition of your employment. For example, if a company hires an employee in a different state and requires that the new employee work in his or her home, then that person is eligible for the deduction. However, if the company offers the new employee an office, but the person opts to work at home, he or she is not eligible.

Gross income. This is not your total earnings. Rather, it's your total business income less all ordinary and necessary expenses not directly related to the office space. For example, say your total earnings were \$7,500 but your necessary expenses (other than those related to your office space) were \$227 for advertising, \$233 for supplies, and \$125 for professional publications. You would enter \$6,915 for your gross income.

Direct and indirect expenses. Direct expenses are expenditures that are only for the immediate office space, while indirect expenses affect your office but are not confined exclusively to it. The costs of repairing a heating system and painting the exterior of your home, for example, are indirect maintenance and repair expenses. The amounts you spend on painting the interior of your office and replacing a broken office window are direct maintenance and repair expenses.

Depreciation. The Internal Revenue Code specifies that depreciation be calculated in the following way: Multiply the adjusted basis of the home (cost less land value) by the business percentage (percent of home used for business); divide that result by 31.5 years, and multiply by the number of months in use minus

0.5 months; and finally, divide by 12 months. For example, suppose the house was purchased in January 1987 and has an adjusted basis of \$78,000. Assume that 20 percent of the home is used for business and that your home office was in use all 12 months of the year. Then the maximum allowable depreciation is: $\$78,000 \times 20\% \div 31.5 \times 11.5 \div 12 = \475 .

EDITOR'S NOTE: This method is for home offices that were started in 1987. If the home office was started prior to 1987, then the depreciation is calculated using the method prescribed for that year.

THE SUMMARY

Part IV of the worksheet summarizes your deductions and explains what to do with them. The portion of your "primary deductions" (mortgage interest and real-estate taxes) not included in the home-office deduction can be deducted on Schedule A; this "personal portion" is shown in Item A.

The total for depreciation (Item B) must be entered on Form 4562.

Item C tells you your total allowable home-office deduction for this year. You enter this number on Schedule C if you are self-employed or run a day-care center and on Form 2106 if you are an employee.

Item D tells you how much of your home-office expenses couldn't be deducted this year. You should carry over this amount to next year's home-office calculation.

The final figure, Item E, is the total amount of your casualty loss. It was not incorporated into your home-office deduction, but merely served as a limit on that deduction. Transfer this amount to Form 4684.

INTERNAL REVENUE SERVICE PUBLICATIONS OF INTEREST

NUMBER	TITLE
17	Your Federal Income Tax
334	Tax Guide For Small Business
519	Condemnations and Business Casualties and Thefts
530	Tax Information for Owners of Homes, Condominiums and Cooperative Apartments
534	Depreciation and Amortization
535	Business Expense
587	Business Use Of Your Home
	Also available are instructions for Form 4562 (Depreciation and Amortization) and Form 4684 (Casualty Loss).

To obtain these publications, call (800) 424-FORM or (800) 424-3676.

FOR SPREADSHEET USERS

If you prefer to use the spreadsheet version of *Home-Office Deduction Worksheet*, follow these instructions carefully. A small typing error will result in either incorrect computations or a worksheet that does not look like Figure 1.

To begin, load your spreadsheet program and make sure you're working with a blank spreadsheet.

FORMATTING

Set the widths of your spreadsheet columns as follows:

COLUMN	A	B	C	D	E	F	G	H	I
--------	---	---	---	---	---	---	---	---	---

WIDTH	6	11	29	10	12	10	24	18	10
-------	---	----	----	----	----	----	----	----	----

Then format the following cells as shown.

CELL	FORMAT
D1, D2, D28, E28	Right-justified text
E22, E23	Integer (for instance, no decimal places)
E24 to I63, G22, G23	Two decimal places
F24	Percent

For users of Microsoft Multiplan and similar programs: In these instructions, rows are referred to by number and columns by letter. You'll have to translate these cell references into the RC notation accepted by your spreadsheet.

INSERTING TEXT

Once your formatting is complete, insert the text in the following list into the indicated cells. Be sure to copy the correct number of spaces so that, when printed, the spreadsheet will look like Figure 1.

CELL	TEXT
A2	Name:
A6	PART I: REQUIREMENTS
A7	Check one:
A11	If self-employed or employee -
A12	Was area used exclusively and regularly for business?
A15	If employee - Was the area used for the employer's convenience?
A18	If day-care center - How many days was the area used?
A21	PART II: BUSINESS PERCENTAGE
A26	PART III: ALLOWABLE DEDUCTIONS
A56	PART IV: SUMMARY
B8	Self-employed
B9	Employee
B10	Day-care center
B13	Yes
B14	No
B16	Yes
B17	No
B22	Square feet used for business
B23	Total square feet in home
B24	Business percentage (area % x time %)
B27	1. Gross income (deduction limitation)
B28	2. Primary deductions

PRODUCTIVITY PROGRAM

B29	a) Mortgage interest
B30	b) Real-estate taxes
B31	c) Casualty loss
B32	3. Total of primary deductions
B34	4. Remaining deduction limitation
B35	5. Secondary deductions
B36	a) Utilities
B37	b) Insurance
B38	c) Maintenance and repairs
B39	d) Rent
B40	e) Other indirect expenses
B41	f) Direct maintenance and repair
B42	g) Other direct expenses
B43	6. Total of secondary deductions
B45	7. Remaining deduction limitation
B46	8. Depreciation
B48	9. Remaining deduction limitation
B49	10. Total amount of home-office expense carried over from last year
B50	11. Excess of gross income over allowable deductions
B52	12. Excess of allowable deductions over limitation
B57	A. Transfer personal portion of primary deductions to Schedule A, if applicable.
B58	a) Mortgage interest
B60	B. Transfer total depreciation allowed to Form 4562
B61	C. Total allowable home-office expense for current year
B62	D. Total unused home-office expense (carry over to next year)
B63	E. Transfer casualty loss to Form 4684
C4	STATEMENT OF EXPENSES FOR BUSINESS USE OF HOME
C13	How many months was area used?
C19	How many hours/day was the area used?
C59	b) Real-estate taxes
D1	Year:
D2	SSN:
D28	Total
E28	Business %
F33	-----
F44	-----
F47	-----
F51	-----
F53	=====
F55	=====

INSERTING FORMULAS

Write the formulas that will perform the following operations. An example for the first two types (SUM and IF formulas) is given below for five spreadsheets. If your spreadsheet is not in the list, consult your manual for the correct syntax.

CELL FORMULA

F32	The sum of cells E29 to E31 (see examples of SUM formulas below)
F43	The sum of cells E36 to E42
F54	The sum of cells I36 to I50
F61	The sum of cells H29 to H50 minus cell H46
F24	If cell A10 is blank then copy the contents of cell G22 else copy the contents of cell G23 (see examples of IF formulas below)
G29	If cell E29 is greater than cell F27 then 0 else cell F27 minus cell E29
G30	If cell E30 is greater than cell G29 then 0 else cell G29 minus cell E30
G31	If cell E31 is greater than cell G30 then 0 else cell G30 minus cell E31
G36	If cell E36 is greater than cell G31 then 0 else cell G31 minus cell E36
G37	If cell E37 is greater than cell G36 then 0 else cell G36 minus cell E37
G38	If cell E38 is greater than cell G37 then 0 else cell G37 minus cell E38
G39	If cell E39 is greater than cell G38 then 0 else cell G38 minus cell E39
G40	If cell E40 is greater than cell G39 then 0 else cell G39 minus cell E40
G41	If cell E41 is greater than cell G40 then

G42	0 else cell G40 minus cell E41
G46	If cell E42 is greater than cell G41 then 0 else cell G41 minus cell E42
G50	If cell F46 is greater than cell F45 then 0 else cell F45 minus cell F46
H29	If cell G29 equals 0 then cell F27 else cell E29
H30	If cell G30 equals 0 then cell G29 else cell E30
H36	If cell G36 equals 0 then cell G31 else cell E39
H37	If cell G37 equals 0 then cell G36 else cell E37
H38	If cell G38 equals 0 then cell G37 else cell E38
H39	If cell G39 equals 0 then cell G38 else cell E39
H40	If cell G40 equals 0 then cell G39 else cell E40
H41	If cell G41 equals 0 then cell G40 else cell E41
H42	If cell G42 equals 0 then cell G41 else cell E42
H46	If cell G46 equals 0 then cell F45 else cell F46
H50	If cell G50 equals 0 then cell F48 else cell F50
E29	Cell D29 multiplied by cell F24
E30	Cell D30 multiplied by cell F24
E31	Cell D31 multiplied by cell F24
E36	Cell D36 multiplied by cell F24
E37	Cell D37 multiplied by cell F24
E38	Cell D38 multiplied by cell F24
E39	Cell D39 multiplied by cell F24
E40	Cell D40 multiplied by cell F24

E41	Cell D41
E42	Cell D42
F34	Cell G31
F45	Cell G42
F48	Cell G46
F52	Cell G50
F60	Cell H46
F62	Cell F54
F63	Cell D31

F58	Cell D29 minus cell H29
F59	Cell D30 minus cell H30
I29	Cell E29 minus cell H29
I30	Cell E30 minus cell H30
I36	Cell E36 minus cell H36
I37	Cell E37 minus cell H37
I38	Cell E38 minus cell H38
I39	Cell E39 minus cell H39
I40	Cell E40 minus cell H40
I41	Cell E41 minus cell H41
I42	Cell E42 minus cell H42
I46	Cell F46 minus cell H46
I50	Cell F50 minus cell H50
G22	Cell E22 divided by cell E23 times cell E13 divided by 12
G23	Cell E22 divided by cell E23 times cell F18 times cell F19 divided by 8760

H31	0
I31	0

USING THE SPREADSHEET TEMPLATE

Once you have completed all of the previous steps, save your worksheet. You can then call it up over and over again, filling in different numbers.

Now just type the information that applies to your home office into the following cells:

CELL	DATA TO SUPPLY
E1	Insert the tax year
B2	Insert your name
E2	Insert your Social Security number
A8 or A9 or A10	Insert an asterisk in the cell that best describes your occupational status

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On-screen menus provide "at-a-glance" summaries of the features of the program. When you select a feature from the menu bar, a menu drops down to show all of the available options. Every command available is displayed in the drop-down menu. You will find that you will spend less time getting to know the program and more time on your projects. And since each member of the Easy Working family uses the same command structure, once you learn how to use one, you'll find a head start on learning to use the other two. But don't be fooled. Easy doesn't mean incomplete. Easy Working products are full-featured.

Easy Working™ : The Writer™ :

Complete word processing features allow you to create your letters and reports and arrange them to suit your needs, includes 100,000 word spellchecker. Editing functions include insert, delete, cut, paste, and copy.

Easy Working™ : The Filer™ :

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Easy Working™ : The Planner™ :

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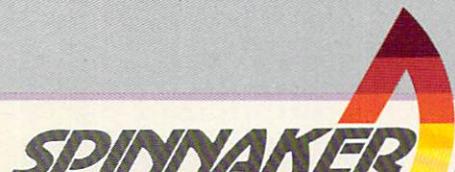
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CIRCLE READER SERVICE 28

PRODUCTIVITY PROGRAM

A13 or A14	Insert an asterisk in the cell that answers the question "Was the area used exclusively and regularly for business?"
A16 or A17	Insert an asterisk in the cell that answers the question "Was the area used for your employer's convenience?"
E13	Insert the number of months the area was used
F18, F19	Insert the answers to the two questions pertaining to day-care centers
E22, E23	Insert the square feet used for business and total square feet
F27	Insert your business gross income
D29, D30, D31, D36, D37, D38, D39, D40, D41, D42	Insert the proper amounts for each individual deduction category
F46	Insert the amount of depreciation
F50	Insert the amount of home-office expense carried over from last year

After you've filled in the data for this year, save your worksheet under a different name.

EXAMPLES OF "IF" AND "SUM" FORMULAS FOR FIVE POPULAR SPREADSHEETS

Spreadsheet SUM function

Appleworks	=SUM(E29 . . . E31)	(example is cell F32)
Lotus 1-2-3	@SUM(E29..E31)	(example is cell F24)
Excel	=SUM(E29:E31)	@IF(A10=""",G22,G23)
Multiplan	=SUM(R29C5:R31C5)	=IF(A10=""",G22,G23)
SwiftCalc	SUM(E29:E31)	=IF(R10C1=""",R22C7,R23C7)

IF function

Appleworks	@IF(A10=""",G22,G23)	(example is cell F24)
Lotus 1-2-3	@IF(A10=""",G22,G23)	(example is cell F24)
Excel	=IF(A10=""",G22,G23)	=IF(A10=""",G22,G23)
Multiplan	=IF(R10C1=""",R22C7,R23C7)	=IF(R10C1=""",R22C7,R23C7)
SwiftCalc	IF A10="" THEN G22 ELSE G23	IF A10="" THEN G22 ELSE G23

EDITORS NOTE: The equal sign (=) in Microsoft's Multiplan will not appear in the cell but must be typed to let the program know you are entering a formula. When entering the SUM function into AppleWorks and Lotus 1-2-3, you need only type one period, and the program will supply the rest.

Apple II series w/printer/Home-Office Deduction Worksheet

```

10 DIM BP(13),DA(13,5),QN(3,2),TA(6),A$(7),B$(3)
20 DIM D$(15),G$(3),P$(4),Q$(7),S$(3),SA$(3)
30 FOR X = 1 TO 3:FOR Y = 1 TO 2:READ QN(X,Y):NEXT Y,X
40 FOR X = 1 TO 3:READ B$(X):NEXT X:FOR X = 1 TO 15
50 READ D$(X):NEXT X:FOR X = 1 TO 3:READ G$(X):NEXT X
60 FOR X = 1 TO 4:READ P$(X):NEXT X:FOR X = 1 TO 7
70 READ Q$(X):NEXT X:FOR X = 1 TO 3:READ S$(X):NEXT X
80 SP$ = CHR$(32):FOR X = 2 TO 68:SP$ = SP$+CHR$(32)
90 NEXT X:DD$ = SP$:SD$ = SP$:FOR X = 1 TO 11
100 DD$ = DD$+CHR$(61):SD$ = SD$+CHR$(45):NEXT X
110 MD$ = ".":FOR X = 1 TO 26:MD$ = MD$+".":NEXT X
120 RD$ = "REMAINING DEDUCTION LIMITATION"
130 HOME:VTAB 2:HTAB 11:PRINT P$(1):PRINT
140 FOR X = 1 TO 3:PRINT S$(X);":":NEXT X
150 FOR X = 1 TO 3:VTAB 3+X:HTAB 7:INPUT "",SA$(X)
160 NEXT X:PRINT:PRINT "OCCUPATIONAL STATUS:"
170 FOR X = 1 TO 3:PRINT X;";G$(X):NEXT X:PRINT
180 PRINT "SELECT ONE: ";
190 GET K$:IF K$ < "1" OR K$ > "3" THEN 190
200 PRINT K$:OC = VAL(K$):PRINT:PRINT
210 FOR X = QN(OC,1) TO QN(OC,2):PRINT Q$(X);
220 IF X = 1 THEN PRINT:PRINT Q$(2);:X = 2:GOTO 240
230 IF X = 4 THEN PRINT:PRINT Q$(5);
240 INPUT "?";A$(X):PRINT:PRINT
250 GOSUB 2000:IF K$ = "N" THEN 130
260 HOME:VTAB 2:HTAB 7:PRINT P$(2):PRINT
270 FOR X = 1 TO 2:PRINT B$(X):NEXT X:C = 35:NL = 6
280 FOR X = 1 TO 2:R = 3+X:LN = LEN(B$(X))+1

```

```

290 GOSUB 3000:BP(X) = VAL(NUM$):NEXT X
300 PRINT:GOSUB 2000:IF K$ = "N" THEN 260
310 IF BP(2) = 0 THEN BP(3) = 0:GOTO 340
320 IF OC = 3 THEN BP(3) = BP(1)/BP(2)*VAL(A$(6))*VAL(A$(7))/8760:GOTO 340
330 BP(3) = BP(1)/BP(2)*VAL(A$(3))/12
340 HOME:VTAB 2:HTAB 5:PRINT P$(3):PRINT
350 FOR X = 1 TO 15:PRINT D$(X):NEXT X:C = 32:NL = 9
360 FOR X = 1 TO 13:R = 3+X:LN = LEN(D$(X))+1
370 IF X = 13 THEN R = 18:LN = 11
380 GOSUB 3000:DA(X,1) = VAL(NUM$):NEXT X
390 VTAB 20:HTAB 1:GOSUB 2000:IF K$ = "N" THEN 340
400 HOME:VTAB 12:HTAB 1
410 PRINT "CALCULATING DEDUCTION; PLEASE STAND BY."
420 DA(1,3) = DA(1,1)
430 FOR X = 2 TO 9:DA(X,2) = DA(X,1)*BP(3):NEXT X
440 FOR X = 10 TO 13:DA(X,2) = DA(X,1):NEXT X
450 FOR X = 2 TO 13
460 IF DA(X,2) > DA(X-1,3) THEN DA(X,3) = 0:GOTO 480
470 DA(X,3) = DA(X-1,3)-DA(X,2)
480 IF DA(X,3) = 0 THEN DA(X,4) = DA(X-1,3):GOTO 500
490 DA(X,4) = DA(X,2)
500 DA(X,5) = DA(X,2)-DA(X,4):NEXT X
510 DA(4,4) = 0:DA(4,5) = 0:TA(1) = 0
520 FOR X = 2 TO 4:TA(1) = TA(1)+DA(X,2):NEXT X
530 TA(2) = 0:FOR X = 5 TO 11:TA(2) = TA(2)+DA(X,2)
540 NEXT X:TA(3) = 0
550 FOR X = 5 TO 13:TA(3) = TA(3)+DA(X,5):NEXT X
560 TA(4) = DA(2,1)-DA(2,4):TA(5) = DA(3,1)-DA(3,4)
570 TA(6) = 0:FOR X = 2 TO 11:TA(6) = TA(6)+DA(X,4)
580 NEXT X:TA(6) = TA(6)+DA(13,4):HOME:VTAB 12:HTAB 2
590 PRINT "PRESS ANY KEY WHEN PRINTER IS READY."
600 GET K$:HOME:VTAB 12:HTAB 7
610 PRINT "PRINTING; PLEASE STAND BY."
620 PRINT CHR$(4); "PR#1"
630 PRINT SPC(60);S$(1);": ";SA$(1)
640 PRINT S$(2);": ";SA$(2);SPC(54-LEN(SA$(2)));S$(3);": ";SA$(3)
650 PRINT:PRINT SPC(17); "STATEMENT OF EXPENSES FOR BUSINESS USE OF HOME"
660 PRINT:PRINT P$(1):PRINT "CHECK ONE:"
670 FOR X = 1 TO 3:Z$ = "[ ] "
680 IF X = OC THEN Z$ = "[*] "
690 PRINT SPC(2);Z$;G$(X):NEXT X:PRINT
700 FOR X = QN(OC,1) TO QN(OC,2):PRINT Q$(X);
710 IF X = 1 THEN PRINT Q$(2);:X = 2
720 IF X = 4 THEN PRINT Q$(5);
730 PRINT "?";A$(X):NEXT X:PRINT
740 PRINT P$(2):FOR X = 1 TO 2:T$ = STR$(INT(BP(X)))
750 PRINT SPC(5);B$(X);SPC(58-LEN(B$(X))-LEN(T$));T$
760 NEXT X:T$ = STR$(INT(BP(3)*100))
770 PRINT SPC(5);B$(3);SPC(73-LEN(B$(3))-LEN(T$));T$;""
780 PRINT:PRINT P$(3):US = "1. "+D$(1)
790 T = DA(1,1):GOSUB 4000
800 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$
810 PRINT SPC(5); "2. PRIMARY DEDUCTIONS";SPC(26); "TOTAL";SPC(3); "BUSINESS %"
820 FOR X = 2 TO 4:US = CHR$(95+X)+" "+D$(X)
830 T = DA(X,1):GOSUB 4000
840 PRINT SPC(8);US;SPC(49-LEN(US)-LEN(T$));T$;
850 T = DA(X,2):GOSUB 4000
860 PRINT SPC(13-LEN(T$));T$:NEXT X
870 US = "3. TOTAL OF PRIMARY DEDUCTIONS"
880 T = TA(1):GOSUB 4000
890 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$
900 PRINT SD$:US = "4. "+RD$:T = DA(4,3):GOSUB 4000
910 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$
920 PRINT SPC(5); "5. SECONDARY DEDUCTIONS"
930 FOR X = 5 TO 11:US = CHR$(92+X)+" "+D$(X)
940 T = DA(X,1):GOSUB 4000
950 PRINT SPC(8);US;SPC(49-LEN(US)-LEN(T$));T$;
960 T = DA(X,2):GOSUB 4000
970 PRINT SPC(13-LEN(T$));T$:NEXT X
980 US = "6. TOTAL OF SECONDARY DEDUCTIONS"
990 T = TA(2):GOSUB 4000

```

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CIRCLE READER SERVICE 20

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PRODUCTIVITY PROGRAM

```

1000 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1010 PRINT SD$:US = "7. "+RD$:T = DA(11,3):GOSUB 4000  

1020 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1030 US = "8. "+D$(12):T = DA(12,1):GOSUB 4000  

1040 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1050 PRINT SD$:US = "9. "+RD$:T = DA(12,3):GOSUB 4000  

1060 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1070 US = "10. "+D$(13):PRINT SPC(4);US  

1080 US = D$(14)+D$(15):T = DA(13,1):GOSUB 4000  

1090 PRINT SPC(8);US;SPC(71-LEN(US)-LEN(T$));T$  

1100 PRINT SDS  

1110 US = "11. EXCESS OF GROSS INCOME OVER ALLOWABLE DEDUCTIONS"  

1120 T = DA(13,3):GOSUB 4000  

1130 PRINT SPC(4);US;SPC(75-LEN(US)-LEN(T$));T$  

1140 PRINT DDS  

1150 US = "12. EXCESS OF ALLOWABLE DEDUCTIONS OVER LIMITATION"  

1160 T = TA(3):GOSUB 4000  

1170 PRINT SPC(4);US;SPC(75-LEN(US)-LEN(T$));T$  

1180 PRINT DDS:PRINT:PRINT PS(4)  

1190 PRINT SPC(5);;"A. TRANSFER PERSONAL PORTION OF MARY DEDUCTIONS TO"  

1200 PRINT SPC(9);;"SCHEDULE A, IF APPLICABLE"  

1210 FOR X = 2 TO 3:US = CHR$(95+X)+" "+D$(X)  

1220 T = TA(2+X):GOSUB 4000  

1230 PRINT SPC(10);US;SPC(69-LEN(US)-LEN(T$));T$  

1240 NEXT X  

1250 US = "B. TRANSFER TOTAL DEPRECIATION ALLOWED TO FORM 4562"  

1260 T = DA(12,4):GOSUB 4000  

1270 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1280 US = "C. TOTAL ALLOWABLE HOME-OFFICE EXPENSE FOR CURRENT YEAR"  

1290 T = TA(6):GOSUB 4000  

1300 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1310 US = "D. TOTAL UNUSED HOME-OFFICE EXPENSE (CARRY OVER TO NEXT YEAR)"  

1320 T = TA(3):GOSUB 4000  

1330 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1340 US = "E. TRANSFER CASUALTY LOSS TO FORM 4684"  

1350 T = DA(4,1):GOSUB 4000  

1360 PRINT SPC(5);US;SPC(74-LEN(US)-LEN(T$));T$  

1370 PRINT CHR$(4);;"PR#0":HOME:END  

2000 PRINT "ARE THE ABOVE ANSWERS CORRECT? ";:GET K$  

2010 PRINT K$:K$ = CHR$(ASC(K$)-32*(K$ = CHR$(110)))  

2020 RETURN  

3000 NUMS = ":";VTAB R:HTAB LN:PRINT LEFT$(MD$,C-LN);  

3010 GET K$:IF (K$ < "0" OR K$ > "9") AND K$ <> "." AND K$ >> CHR$(13) THEN 3010  

3020 IF K$ = CHR$(13) THEN 3050  

3030 NUMS = NUMS+K$:VTAB R:HTAB C:PRINT NUMS;  

3040 IF LEN(NUMS) < NL THEN 3010  

3050 IF LEN(NUMS) = 0 THEN NUMS = "0":VTAB R:HTAB C:PRINT INT NUMS  

3060 VTAB R:HTAB LN:PRINT LEFT$(SP$,C-LN):RETURN  

4000 IF T = 0 THEN T$ = ".00":RETURN  

4010 IR = INT(T):FR = INT((T-IR)*100+0.5)/100  

4020 T = IR+FR+0.001:T$ = STR$(T)  

4030 T$ = LEFT$(T$,LEN(T$)-1):RETURN  

5000 DATA 1,3,1,4,6,7  

6000 DATA SQUARE FEET USED FOR BUSINESS  

6010 DATA TOTAL SQUARE FEET IN HOME  

6020 DATA BUSINESS PERCENTAGE (AREA % X TIME %)  

6030 DATA GROSS INCOME,MORTGAGE INTEREST  

6040 DATA REAL-ESTATE TAXES,CASUALTY LOSS,UTILITIES  

6050 DATA INSURANCE,MAINTENANCE & REPAIRS,RENT  

6060 DATA OTHER INDIRECT EXPENSES  

6070 DATA DIRECT MAINTENANCE & REPAIRS  

6080 DATA OTHER DIRECT EXPENSES,DEPRECIATION  

6090 DATA TOTAL AMOUNT OF HOME-OFFICE  

6100 DATA " EXPENSE CARRIED OVER FROM"," LAST YEAR"  

6110 DATA SELF-EMPLOYED,EMPLOYEE,DAY-CARE CENTER  

6120 DATA "PART I: REQUIREMENTS"  

6130 DATA "PART II: BUSINESS PERCENTAGE"  

6140 DATA "PART III: ALLOWABLE DEDUCTIONS"

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6150 DATA "PART IV: SUMMARY"  

6160 DATA WAS AREA USED EXCLUSIVELY AND REGULARLY  

6170 DATA " FOR BUSINESS"  

6180 DATA HOW MANY MONTHS WAS AREA USED  

6190 DATA WAS THE AREA USED FOR YOUR EMPLOYER'S  

6200 DATA " CONVENIENCE",HOW MANY DAYS WAS AREA USED  

6210 DATA HOW MANY HOURS/DAY WAS AREA USED  

6220 DATA YEAR,NAME,SSN

```

Commodore 64/128 (C 64 mode) w/printer/Home-Office Deduction Worksheet

```

10 DIM BP(13),DA(13,5),QN(3,2),TA(6),A$(7),B$(3)  

20 DIM D$(15),G$(3),P$(4),Q$(7),S$(3),SA$(3)  

30 FOR X=1 TO 3:FOR Y=1 TO 2:READ QN(X,Y):NEXT Y,X  

40 FOR X=1 TO 3:READ B$(X):NEXT X:FOR X=1 TO 15  

50 READ D$(X):NEXT X:FOR X=1 TO 3:READ G$(X):NEXT X  

60 FOR X=1 TO 4:READ P$(X):NEXT X:FOR X=1 TO 7  

70 READ Q$(X):NEXT X:FOR X=1 TO 3:READ S$(X):NEXT X  

80 SP$=CHR$(32):FOR X=2 TO 68:SP$=SP$+CHR$(32):NEXT X  

90 DDS=SP$:SD$=SP$:FOR X=1 TO 11:DD$=DD$+CHR$(61)  

100 SD$=SD$+CHR$(45):NEXT X  

110 MD$=".":FOR X=1 TO 26:MD$=MD$+".":NEXT X  

120 RD$="REMAINING DEDUCTION LIMITATION"  

130 PRINT CHR$(147):PRINT TAB(11);P$(1):PRINT  

140 FOR X=1 TO 3:PRINT S$(X);":":NEXT X  

150 FOR X=1 TO 3:POKE 214,1+X:PRINT:PRINT TAB(5);  

160 POKE 198,4:POKE 631,20:POKE 632,20:POKE 633,32  

170 POKE 634,32:INPUT SAS(X):NEXT X  

180 PRINT:PRINT "OCCUPATIONAL STATUS:"  

190 FOR X=1 TO 3:PRINT X;G$(X):NEXT X:PRINT  

200 PRINT "SELECT ONE: ";  

210 GET K$:IF K$<"1" OR K$>"3" THEN 210  

220 PRINT K$:OC=VAL(K$):PRINT:PRINT  

230 FOR X=QN(OC,1) TO QN(OC,2):PRINT Q$(X);  

240 IF X=1 THEN PRINT:PRINT Q$(2);:X=2:GOTO 260  

250 IF X=4 THEN PRINT:PRINT Q$(5);  

260 INPUT AS(X):PRINT:NEXT X  

270 GOSUB 2000:IF K$="N" THEN 130  

280 PRINT CHR$(147):PRINT TAB(7);P$(2):PRINT  

290 FOR X=1 TO 2:PRINT BS(X):NEXT X  

300 C=33:NL=6:FOR X=1 TO 2:R=1+X:LN=LEN(B$(X))  

310 GOSUB 3000:BP(X)=VAL(NUM$):NEXT X  

320 PRINT:GOSUB 2000:IF K$="N" THEN 280  

330 IF BP(2)=0 THEN BP(3)=0:GOTO 360  

340 IF OC=3 THEN BP(3)=BP(1)/BP(2)*VAL(A$(6))*VAL(A$(7))/8760:GOTO 360  

350 BP(3)=BP(1)/BP(2)*VAL(A$(3))/12  

360 PRINT CHR$(147):PRINT TAB(5);P$(3):PRINT  

370 FOR X=1 TO 15:PRINT D$(X):NEXT X  

380 C=30:NL=9:FOR X=1 TO 13:R=1+X:LN=LEN(D$(X))  

390 IF X= 13 THEN R=16:LN=10  

400 GOSUB 3000:DA(X,1)=VAL(NUM$):NEXT X  

410 POKE 214,19:PRINT:GOSUB 2000:IF K$="N" THEN 360  

420 PRINT CHR$(147):POKE 214,11:PRINT  

430 PRINT "CALCULATING DEDUCTION; PLEASE STAND BY."  

440 DA(1,3)=DA(1,1)  

450 FOR X=2 TO 9:DA(X,2)=DA(X,1)*BP(3):NEXT X  

460 FOR X=10 TO 13:DA(X,2)=DA(X,1):NEXT X  

470 FOR X=2 TO 13  

480 IF DA(X,2)>DA(X-1,3) THEN DA(X,3)=0:GOTO 500  

490 DA(X,3)=DA(X-1,3)-DA(X,2)  

500 IF DA(X,3)=0 THEN DA(X,4)=DA(X-1,3):GOTO 520  

510 DA(X,4)=DA(X,2)  

520 DA(X,5)=DA(X,2)-DA(X,4):NEXT X  

530 DA(4,4)=0:DA(4,5)=0  

540 TA(1)=0:FOR X=2 TO 4:TA(1)=TA(1)+DA(X,2):NEXT X  

550 TA(2)=0:FOR X=5 TO 11:TA(2)=TA(2)+DA(X,2):NEXT X  

560 TA(3)=0:FOR X=5 TO 13:TA(3)=TA(3)+DA(X,5):NEXT X  

570 TA(4)=DA(2,1)-DA(2,4):TA(5)=DA(3,1)-DA(3,4)  

580 TA(6)=0:FOR X=2 TO 11:TA(6)=TA(6)+DA(X,4):NEXT X  

590 TA(6)=TA(6)+DA(13,4)  

600 PRINT CHR$(147):POKE 214,11:PRINT  

610 PRINT TAB(2);"PRESS ANY KEY WHEN PRINTER IS READY."  

620 GET K$:IF K$="" THEN 620

```

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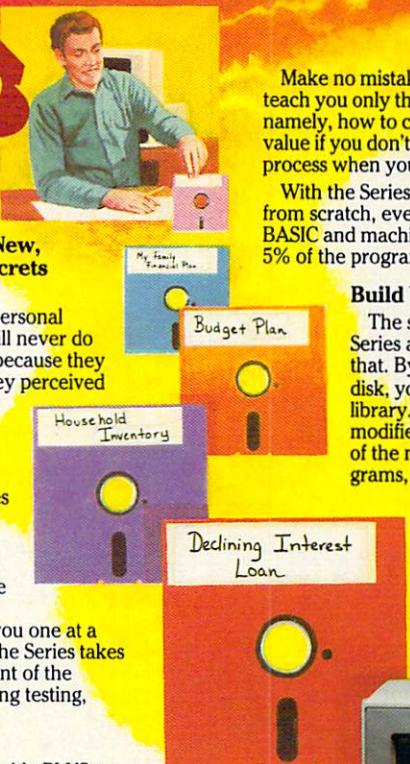
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PRODUCTIVITY PROGRAM

```

630 PRINT CHR$(147):POKE 214,11:PRINT
640 PRINT TAB(7); "PRINTING; PLEASE STAND BY."
650 OPEN 4,4:PRINT#4,SPC(60);S$(1);": ";SA$(1)
660 PRINT#4,S$(2);": ";SA$(2);SPC(54-LEN(SA$(2)));S$(3)
):"; "SA$(3)
670 PRINT#4:PRINT#4,SPC(17); "STATEMENT OF EXPENSES FOR
BUSINESS USE OF HOME"
680 PRINT#4:PRINT#4,P$(1):PRINT#4,"CHECK ONE:"
690 FOR X=1 TO 3:Z$=" [ ] ":IF X=OC THEN Z$="[*] "
700 PRINT#4,SPC(2);Z$;G$(X):NEXT X:PRINT#4
710 FOR X=QN(OC,1) TO QN(OC,2):PRINT#4,Q$(X);
720 IF X=1 THEN PRINT#4,Q$(2);X=2
730 IF X=4 THEN PRINT#4,Q$(5);
740 PRINT#4,"? ";A$(X):NEXT X:PRINT#4
750 PRINT#4,P$(2):FOR X=1 TO 2:T$=STR$(INT(BP(X)))
760 PRINT#4,SPC(5);B$(X);SPC(58-LEN(B$(X))-LEN(T$));T$
770 NEXT X:T$=STR$(INT(BP(3)*100))
780 PRINT#4,SPC(5);B$(3);SPC(73-LEN(B$(3))-LEN(T$));T$
;"%":PRINT#4
790 PRINT#4,P$(3):U$="1. "+D$(1):T=DA(1,1):GOSUB 4000
800 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$
810 PRINT#4,SPC(5); "2. PRIMARY DEDUCTIONS";SPC(26); "TO
TAL";SPC(3); "BUSINESS X"
820 FOR X=2 TO 4:U$=CHR$(95+X)+" "+D$(X)
830 T=DA(X,1):GOSUB 4000
840 PRINT#4,SPC(8);U$;SPC(49-LEN(U$)-LEN(T$));T$;
850 T=DA(X,2):GOSUB 4000
860 PRINT#4,SPC(13-LEN(T$));T$:NEXT X
870 U$="3. TOTAL OF PRIMARY DEDUCTIONS"
880 T=TA(1):GOSUB 4000
890 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
900 PRINT#4,SD$:U$="4. "+RD$:T=DA(4,3):GOSUB 4000
910 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
920 PRINT#4,SPC(5); "5. SECONDARY DEDUCTIONS"
930 FOR X=5 TO 11:U$=CHR$(92+X)+" "+D$(X)
940 T=DA(X,1):GOSUB 4000
950 PRINT#4,SPC(8);U$;SPC(49-LEN(U$)-LEN(T$));T$;
960 T=DA(X,2):GOSUB 4000
970 PRINT#4,SPC(13-LEN(T$));T$:NEXT X
980 U$="6. TOTAL OF SECONDARY DEDUCTIONS"
990 T=TA(2):GOSUB 4000
1000 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1010 PRINT#4,SD$:U$="7. "+RD$:T=DA(11,3):GOSUB 4000
1020 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1030 U$="8. "+D$(12):T=DA(12,1):GOSUB 4000
1040 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1050 PRINT#4,SD$:U$="9. "+RD$:T=DA(12,3):GOSUB 4000
1060 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1070 U$="10. "+D$(13):PRINT#4,SPC(4);U$;
1080 U$=D$(14)+D$(15):T=DA(13,1):GOSUB 4000
1090 PRINT#4,SPC(8);U$;SPC(71-LEN(U$)-LEN(T$));T$;
1100 PRINT#4,SD$;
1110 U$="11. EXCESS OF GROSS INCOME OVER ALLOWABLE DED
UCTIONS"
1120 T=DA(13,3):GOSUB 4000
1130 PRINT#4,SPC(4);U$;SPC(75-LEN(U$)-LEN(T$));T$;
1140 PRINT#4,DD$;
1150 U$="12. EXCESS OF ALLOWABLE DEDUCTIONS OVER LIMIT
ATION"
1160 T=TA(3):GOSUB 4000
1170 PRINT#4,SPC(4);U$;SPC(75-LEN(U$)-LEN(T$));T$;
1180 PRINT#4,DD$:PRINT#4:PRINT#4,P$(4)
1190 PRINT#4,SPC(5); "A. TRANSFER PERSONAL PORTION OF P
RIMARY DEDUCTIONS TO"
1200 PRINT#4,SPC(9); "SCHEDULE A, IF APPLICABLE"
1210 FOR X=2 TO 3:U$=CHR$(95+X)+" "+D$(X)
1220 T=TA(2+X):GOSUB 4000
1230 PRINT#4,SPC(9);U$;SPC(70-LEN(U$)-LEN(T$));T$;
1240 NEXT X
1250 U$="B. TRANSFER TOTAL DEPRECIATION ALLOWED TO FOR
M 4562"
1260 T=DA(12,4):GOSUB 4000
1270 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1280 U$="C. TOTAL ALLOWABLE HOME-OFFICE EXPENSE FOR CU
RENT YEAR"
1290 T=TA(6):GOSUB 4000

```

```

1300 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1310 U$="D. TOTAL UNUSED HOME-OFFICE EXPENSE (CARRY OV
ER TO NEXT YEAR)"
1320 T=TA(3):GOSUB 4000
1330 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1340 U$="E. TRANSFER CASUALTY LOSS TO FORM 4684"
1350 T=DA(4,1):GOSUB 4000
1360 PRINT#4,SPC(5);U$;SPC(74-LEN(U$)-LEN(T$));T$;
1370 CLOSE 4:PRINT CHR$(147):END
2000 PRINT "ARE THE ABOVE ANSWERS CORRECT? ";
2010 GET K$:IF K$="" THEN 2010
2020 PRINT K$:K$=CHR$(ASC(K$)+32*(K$=CHR$(109)))
2030 RETURN
3000 NUM$="":POKE 214,R:PRINT
3010 PRINT TAB(LN);LEFT$(MDS,C-LN)
3020 GET K$:IF (K$<"0" OR K$>"9") AND K$<>". " AND K$<>
CHR$(13) THEN 3020
3030 IF K$=CHR$(13) THEN 3060
3040 NUM$=NUM$+K$:POKE 214,R:PRINT:PRINT TAB(C);NUM$;
3050 IF LEN(NUM$)<NL THEN 3020
3060 IF LEN(NUM$)=0 THEN NUM$="0":POKE 214,R:PRINT:PRI
NT TAB(C);NUM$;
3070 POKE 214,R:PRINT:PRINT TAB(LN);LEFT$(SP$,C-LN)
3080 RETURN
4000 IF T=0 THEN T$="0.00":RETURN
4010 IF T>999999 THEN 4050
4020 IR=INT(T):FR=INT((T-IR)*100+0.5)/100
4030 T=IR+FR+.001:T$=STR$(T)
4040 T$=LEFT$(T$,LEN(T$)-1):RETURN
4050 T$=MID$(STR$(INT(T)),2)+".00":RETURN
5000 DATA 1,3,1,4,6,7
6000 DATA SQUARE FEET USED FOR BUSINESS
6010 DATA TOTAL SQUARE FEET IN HOME
6020 DATA BUSINESS PERCENTAGE (AREA % X TIME %)
6030 DATA GROSS INCOME,MORTGAGE INTEREST
6040 DATA REAL-ESTATE TAXES,CASUALTY LOSS,UTILITIES
6050 DATA INSURANCE,MAINTENANCE & REPAIRS,RENT
6060 DATA OTHER INDIRECT EXPENSES
6070 DATA DIRECT MAINTENANCE & REPAIRS
6080 DATA OTHER DIRECT EXPENSES,DEPRECIATION
6090 DATA TOTAL AMOUNT OF HOME-OFFICE
6100 DATA " EXPENSE CARRIED OVER FROM", " LAST YEAR"
6110 DATA SELF-EMPLOYED,EMPLOYEE,DAY-CARE CENTER
6120 DATA "PART I: REQUIREMENTS"
6130 DATA "PART II: BUSINESS PERCENTAGE"
6140 DATA "PART III: ALLOWABLE DEDUCTIONS"
6150 DATA "PART IV: SUMMARY"
6160 DATA WAS AREA USED EXCLUSIVELY AND REGULARLY
6170 DATA " FOR BUSINESS"
6180 DATA HOW MANY MONTHS WAS AREA USED
6190 DATA WAS THE AREA USED FOR YOUR EMPLOYER'S
6200 DATA " CONVENIENCE",HOW MANY DAYS WAS AREA USED
6210 DATA HOW MANY HOURS/DAY WAS AREA USED
6220 DATA YEAR,NAME,SSN

```

**IBM PC & compatibles w/printer/Home-Office De
duction Worksheet**

```

10 DIM BP(13),DA(13,5),QN(3,2),TA(6),A$(7),B$(3)
20 DIM D$(15),G$(3),P$(4),Q$(7),S$(3),SA$(3)
30 KEY OFF:LOCATE ,0:COLOR 7,0
50 FOR X=1 TO 3:FOR Y=1 TO 2:READ QN(X,Y):NEXT Y,X
60 FOR X=1 TO 3:READ B$(X):NEXT X
70 FOR X=1 TO 15:READ D$(X):NEXT X
80 FOR X=1 TO 3:READ G$(X):NEXT X
90 FOR X=1 TO 4:READ P$(X):NEXT X
100 FOR X=1 TO 7:READ Q$(X):NEXT X
110 FOR X=1 TO 3:READ S$(X):NEXT X:SP$=SPACE$(68)
120 DD$=SP$+STRING$(11,61):SD$=SP$+STRING$(11,45)
130 RD$="Remaining deduction limitation"
140 CLS:LOCATE 2,11:PRINT P$(1):PRINT
150 FOR X=1 TO 3:PRINT S$(X);": ":NEXT X
160 FOR X=1 TO 3:LOCATE 3+X,7:INPUT "",S$(X):NEXT X
170 PRINT:PRINT "Occupational status:"
180 FOR X=1 TO 3:PRINT X;G$(X):NEXT X:PRINT
190 PRINT "Select one: "

```

The standard equipment on a Laser 128 is optional on most computers

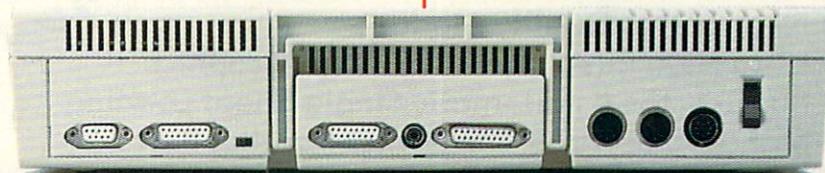


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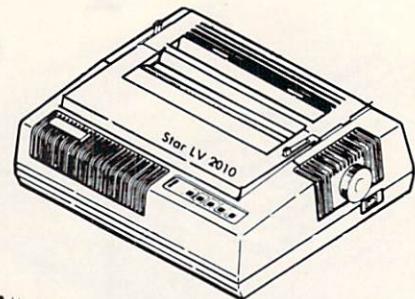
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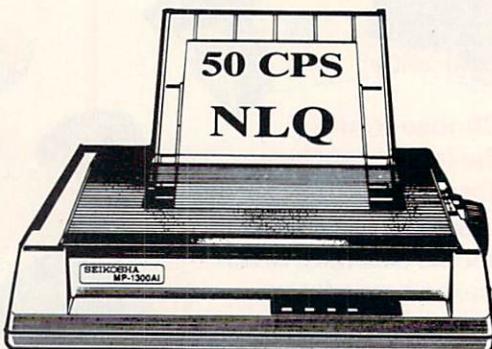
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PRODUCTIVITY PROGRAM

```

200 K$=INKEY$:IF K$<"1" OR K$>"3" THEN 200
210 PRINT K$:OC=VAL(K$):PRINT:PRINT
220 FOR X=QN(OC,1) TO QN(OC,2):PRINT Q$(X);
230 IF X=1 THEN PRINT:PRINT Q$(2);:X=2
240 IF X=4 THEN PRINT:PRINT Q$(5);
250 INPUT A$(X):PRINT:NEXT X
260 GOSUB 2000:IF K$="N" THEN 140
270 CLS:LOCATE 2,7:PRINT P$(2):PRINT
280 FOR X=1 TO 2:PRINT B$(X):NEXT X
290 C=35:NL=6:FOR X=1 TO 2:R=3+X:LN=LEN(B$(X))+1
300 GOSUB 3000:BP(X)=VAL(NUS):NEXT X
310 PRINT:GOSUB 2000:IF K$="N" THEN 270
320 IF OC=3 THEN BP(3)=BP(1)/BP(2)*VAL(A$(6))*VAL(A$(7))
/8760:GOTO 340
330 BP(3)=BP(1)/BP(2)*VAL(A$(3))/12
340 CLS:LOCATE 2,5:PRINT P$(3):PRINT
350 FOR X=1 TO 15:PRINT D$(X):NEXT X
360 C=32:NL=9:FOR X=1 TO 13:R=3+X:LN=LEN(D$(X))+1
370 IF X=13 THEN R=18:LN=11
380 GOSUB 3000:DA(X,1)=VAL(NUS):NEXT X
390 LOCATE 20,1:GOSUB 2000:IF K$="N" THEN 340
400 CLS:LOCATE 12,21
410 PRINT "Calculating deduction; please stand by."
420 DA(1,3)=DA(1,1)
430 FOR X=2 TO 9:DA(X,2)=DA(X,1)*BP(3):NEXT X
440 FOR X=10 TO 13:DA(X,2)=DA(X,1):NEXT X
450 FOR X=2 TO 13
460 IF DA(X,2)>DA(X-1,3) THEN DA(X,3)=0 ELSE DA(X,3)=DA(X-1,3)-DA(X,2)
470 IF DA(X,3)=0 THEN DA(X,4)=DA(X-1,3) ELSE DA(X,4)=DA(X,2)
480 DA(X,5)=DA(X,2)-DA(X,4):NEXT X:DA(4,4)=0:DA(4,5)=0
490 TA(1)=0:FOR X=2 TO 4:TA(1)=TA(1)+DA(X,2):NEXT X
500 TA(2)=0:FOR X=5 TO 11:TA(2)=TA(2)+DA(X,2):NEXT X
510 TA(3)=0:FOR X=5 TO 13:TA(3)=TA(3)+DA(X,5):NEXT X
520 TA(4)=DA(2,1)-DA(2,4):TA(5)=DA(3,1)-DA(3,4)
530 TA(6)=0:FOR X=2 TO 11:TA(6)=TA(6)+DA(X,4):NEXT X
540 TA(6)=TA(6)+DA(13,4):CLS:LOCATE 12,22
550 PRINT "Press any key when printer is ready."
560 K$=INKEY$:IF K$="" THEN 560
570 CLS:LOCATE 12,27
580 PRINT "Printing; please stand by."
590 F1$=SPACE$(5)+"$"+SPACE$(46)+"$"+STRING$(10,35)
600 F2$=SPACE$(5)+"$"+SPACE$(59)+"$"+STRING$(10,35)
610 F3$=F2$+"#":F2$=F2$+"%"
620 F4$=SPACE$(8)+"$"+SPACE$(36)+"$"+STRING$(8,35)+".#"
#+SPACES$(2)+STRING$(8,35)+"#"
630 F5$=SPACE$(4)+"$"+SPACE$(60)+"$"+STRING$(10,35)+".#"
#
640 LPRINT SPC(60);S$(1);";";SA$(1)
650 LPRINT S$(2);";";SA$(2);SPC(54-LEN(SA$(2)));S$(3)
";";SA$(3)
660 LPRINT:LPRT SPC(17);,"STATEMENT OF EXPENSES FOR B
USINESS USE OF HOME"
670 LPRINT:LPRT P$(1):LPRT "Check one:"
680 FOR X=1 TO 3:IF X=OC THEN Z$="[*]" ELSE Z$="[]"
690 LPRINT SPC(2);Z$;G$(X):NEXT X:LPRINT
700 FOR X=QN(OC,1) TO QN(OC,2):LPRINT Q$(X);
710 IF X=1 THEN LPRINT Q$(2);:X=2
720 IF X=4 THEN LPRINT Q$(5);
730 LPRINT "? ";A$(X):NEXT X:LPRINT
740 LPRINT P$(2):FOR X=1 TO 2
750 LPRINT USING F1$;B$(X);BP(X):NEXT X
760 LPRINT USING F2$;B$(3);BP(3)*100:LPRINT
770 LPRINT P$(3):U$="1." "+D$(1)
780 LPRINT USING F3$;U$;DA(1,1)
790 LPRINT SPC(5);,"2. Primary deductions";SPC(26);,"Tot
al";SPC(3);,"Business %"
800 FOR X=2 TO 4:U$=CHR$(95+X)+" " "+D$(X)
810 LPRINT USING F4$;U$;DA(X,1);DA(X,2):NEXT X
820 U$="3. Total of primary deductions"
830 LPRINT USING F3$;U$;TA(1):LPRT SD$
840 U$="4." "+RD$:LPRT USING F3$;U$;DA(4,3)
850 LPRINT SPC(5);,"5. Secondary deductions"
860 FOR X=5 TO 11:U$=CHR$(95+X)+" " "+D$(X)
870 LPRINT USING F4$;U$;DA(X,1);DA(X,2):NEXT X

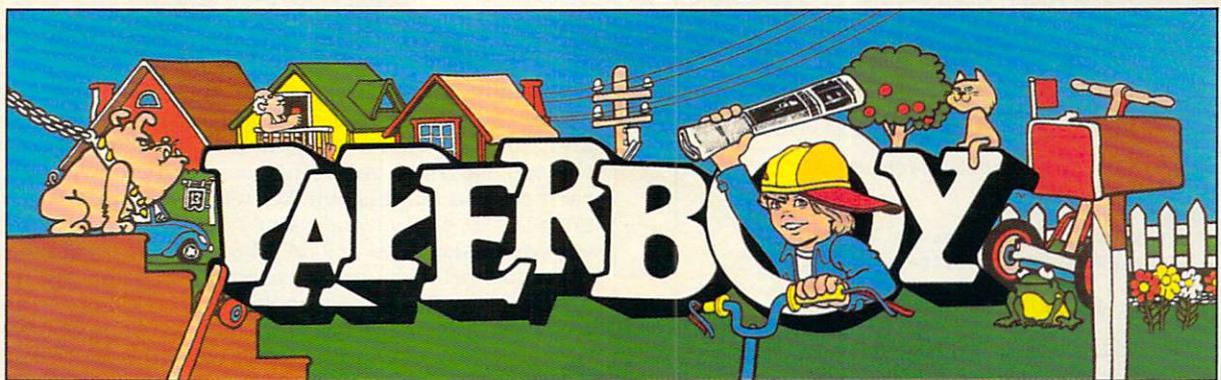
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880 U$="6. Total of secondary deductions"
890 LPRT USING F3$;U$;TA(2):LPRT SD$
900 U$="7." "+RD$:LPRT USING F3$;U$;DA(11,3)
910 U$="8." "+D$(12):LPRT USING F3$;U$;DA(12,1)
920 LPRT SD$;U$="9." "+RD$
930 LPRT USING F3$;U$;DA(12,3)
940 LPRT SPC(4);,"10." "+D$(13)
950 U$=SPACE$(4)+D$(14)+D$(15)
960 LPRT USING F5$;U$;DA(13,1):LPRT DD$ 
970 U$="11. Excess of gross income over allowable dedu
ctions"
980 LPRT USING F5$;U$;DA(13,3):LPRT DD$ 
990 U$="12. Excess of allowable deductions over limita
tion"
1000 LPRT USING F5$;U$;TA(3):LPRT DD$ 
1010 LPRT:LPRT P$(4)
1020 LPRT SPC(5);,"A. Transfer personal portion of pr
imary deductions to"
1030 LPRT SPC(9);,"Schedule A, if applicable"
1040 FOR X=2 TO 3:U$=SPACE$(5)+CHR$(95+X)+" " "+D$(X)
1050 LPRT USING F3$;U$;TA(2+X):NEXT X
1060 U$="B. Transfer total depreciation allowed to For
m 4562"
1070 LPRT USING F3$;U$;DA(12,4)
1080 U$="C. Total allowable home-office expense for cu
rrent year"
1090 LPRT USING F3$;U$;TA(6)
1100 U$="D. Total unused home-office expense (carry ov
er to next year)"
1110 LPRT USING F3$;U$;TA(3)
1120 U$="E. Transfer casualty loss to Form 4684"
1130 LPRT USING F3$;U$;DA(4,1)
1140 CLS:KEY ON:END
2000 PRINT "Are the above answers correct? ";
2010 K$=INKEY$:IF K$="" THEN 2010
2020 PRINT K$:K$=CHR$(ASC(K$)+32*(K$="n")):RETURN
3000 NUS="":LOCATE R,LN:PRINT STRING$(C-LN,46)
3010 K$=INKEY$:IF (K$<"0" OR K$>"9") AND K$<>"."
AND K
$>CHR$(13) THEN 3010
3020 IF K$=CHR$(13) THEN 3050
3030 NUS=NUS+K$:LOCATE R,C:PRINT NUS;
3040 IF LEN(NUS)<NL THEN 3010 ELSE 3060
3050 IF LEN(NUS)=0 THEN NUS="0":LOCATE R,C:PRINT NUS
3060 LOCATE R,LN:PRINT SPACE$(C-LN):RETURN
4000 DATA 1,3,1,4,6,7
5000 DATA Square feet used for business
5010 DATA Total square feet in home
5020 DATA Business percentage (area % x time %)
5030 DATA Gross income,Mortgage interest
5040 DATA Real-estate taxes,Casualty Loss,Utilities
5050 DATA Insurance,Maintenance & repairs,Rent
5060 DATA Other indirect expenses
5070 DATA Direct maintenance & repairs
5080 DATA Other direct expenses,Depreciation
5090 DATA Total amount of home-office
5100 DATA " expense carried over from"," last year"
5110 DATA Self-employed,Employee,Day-care center
5120 DATA "PART I: REQUIREMENTS"
5130 DATA "PART II: BUSINESS PERCENTAGE"
5140 DATA "PART III: ALLOWABLE DEDUCTIONS"
5150 DATA "PART IV: SUMMARY"
5160 DATA Was area used exclusively and regularly
5170 DATA " for business"
5180 DATA How many months was area used
5190 DATA Was the area used for your employer's
5200 DATA " convenience",How many days was area used
5210 DATA How many hours/day was area used
5220 DATA Year,Name,SSN

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CUT HERE



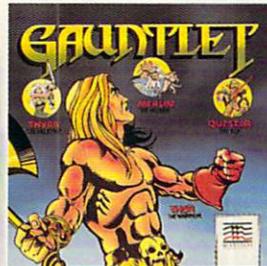
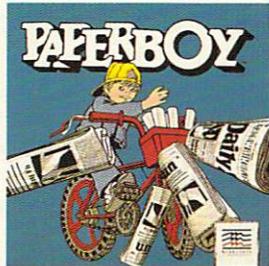
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PRODUCTIVITY PROGRAM

MODIFICATION FOR ANOTHER COMPUTER

Macintosh w/printer/Home-Office Deduction Worksheet

Use the IBM PC version, and change lines 30, 1140, 3050, and 3060 to read as follows:

```
30 WINDOW 1,"HOME-OFFICE DEDUCTION WORKSHEET", (0,38)-(527,338):CALL TEXTFONT(4)
1140 CLS:END
3050 IF LEN(NUM$)=0 THEN NUM$="0"
3060 LOCATE R,LN:PRINT SPACE$(C-LN)
```

Also, add lines 40 and 3070:

```
40 CALL TEXTSIZE(9):CALL TEXTMODE(0):CALL HIDECURSOR
3070 LOCATE R,C:PRINT NUM$:RETURN
```

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PROGRAMMING P.S.

Corrections to Previous Months' Programs

Fun Graphics (September 1987, page 77)

Commodore 128: For the program to run correctly, be sure to run it in 40-column mode, and change line 120 to read as follows:

```
120 IF SC+F>16 THEN COLOR 2,SC+F-15:GOTO 150
```

Home Inventory Manager (October 1987, page 86)

Apple II series: Due to a production error, line 580 is incorrect. The line should read as follows:

```
580 PRINT DS;"CLOSE ";F$;".RAF":HOME:POKE 216,0:END
```

Home Inventory Manager (November 1987, page 98)

Atari 800/XL/XE w/DOS 2.0 or 2.5 (printer optional): Because of a production error, line 8100 is missing from the program listing. The line should read as follows:

```
8100 DX=(DK=2)-(DK=1)
```

SHORT-SHORT PROGRAM CONTEST

If you know BASIC and enjoy a challenge, then enter our programming contest. We're looking for your best and shortest original programs. Just read and follow the contest rules, and return a signed entry form with each contest submission. We will select one \$100 grand-prize winner and one \$75 first-prize winner from all submissions, as well as a \$50 second-prize and a \$25 third-prize winner for each of the computer types listed below. A \$10 honorable mention will go to any other short program that maximizes a computer's capabilities. Selected winning programs will also be published in "The Programmer."

RULES

1. Only completed entries postmarked by March 1, 1988 will be accepted. A completed entry consists of:
 - a. An original program on disk
 - b. A listing of the program
 - c. A short description of the program with a description of hardware requirements
 - d. A completed entry form (copies allowed)
2. The program must be written in interpreted BASIC and may incorporate machine-language routines via PEEKS, POKEs, and CALLs.
3. The program must be 300 characters or less including line numbers. Shorthand commands are not allowed: for example, use PRINT and not PR. or ?.
4. Only standard printable ASCII characters (in the range 32-127, plus carriage return) are allowed in the listing. For example, use CHR\$(166) instead of the checkered flag symbol on the Commodore 64/128.
5. Your program must work on either the Apple II series, Commodore 64/128, IBM PC and compatibles, or Macintosh.
6. All entries become the property of FAMILY & HOME-OFFICE COMPUTING. Winners will be required to guarantee their programs' originality.
7. Entries will be judged by FAMILY & HOME-OFFICE COMPUTING's technical staff. Winners will be chosen by May 1, 1988, and all winning entries will be published in future issues.
8. Employees of Scholastic Inc. and its advertising and promotional advisors and members of their immediate families are not eligible.
9. Void where prohibited by law.
10. Send completed entries to:

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New York, New York 10003

ENTRY FORM

Signature: _____ Date: _____

Parent or Guardian's Signature (if applicant is a minor): _____

Name (please print): _____

Address: _____

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SHAPES AND COLORS

A Matching Game for Preschoolers

BY JOEY LATIMER

Lately, our three-year-old daughter, Erin, has been showing increased interest in our family's computers. Her eyes brightened up the other day when I asked her if she wanted to play a game with the computer.

"What's it called?" she asked.

"Shapes and Colors," I replied.

"Oh, goody! Can I make flowers, Daddy?"

I explained to Erin that *Shapes and Colors* is a game that young children can play to help them learn more about numbers, colors, and shapes. "Can I play it by myself?" she asked. "We'll see," I replied as I typed RUN.

Three-year-old Erin couldn't read the instructions printed on the screen, but with a little help, she was responding to simple color and shape problems with little "Erin-size" key presses.

"This is fun, Daddy. What does this do?" she said as she pressed the reset key . . . Although we did have a few problems, Erin's first exposure to *Shapes and Colors* was a healthy experience for both of us, and she often asks, "Daddy, can we play *Shapes and Colors* today?"

If you have a little someone in your family who might enjoy trying the *Shapes and Colors* program, then type it in, SAVE it, and RUN it. Be sure the program works



correctly before an eager child tries it.

There are six degrees of difficulty from which to choose. It's best to start with the easiest, and as the child masters each, reset the degree of difficulty to the next higher level. At the main menu, you can choose to play either Colors or Shapes. The Shapes game prints a shape on the upper half of the screen and asks the player to match it with one from a group of shapes on the lower half of the screen by typing the corresponding number. Except on the Atari, which has the Shapes feature only, the Colors feature works the same way, with colored squares instead of various shapes.

Apple II series/*Shapes and Colors*

```

10 DIM HOLD(7),LN(4,4),SH(7,2)
20 FOR X = 1 TO 7:FOR Y = 1 TO 2:READ SH(X,Y):NEXT Y,X
30 FOR X = 1 TO 4:FOR Y = 1 TO 4:READ LN(X,Y):NEXT Y,X
40 FOR X = 0 TO 36:READ A:POKE 768+X,A:NEXT X
50 HOME:GR:GOSUB 1000:TEXT:HOME
60 HTAB 10:VTAB 10:PRINT "* SHAPES AND COLORS *"
70 VTAB 13:HTAB 9:PRINT "PRESS ANY KEY TO BEGIN."
80 GOSUB 3010
90 TEXT:HOME:PRINT:PRINT "DO YOU WANT TO PLAY"
100 PRINT:PRINT "<1> SHAPES OR"
110 PRINT "<2> COLORS, OR":PRINT "<3> QUIT?"

```

```

120 VTAB 8:HTAB 1:GOSUB 3000
130 IF K = 3 THEN HOME:END
140 IF K < 1 OR K > 2 THEN 120
150 PRINT K$:GA = K:PRINT:PRINT:PRINT
160 PRINT "PLEASE SET THE DIFFICULTY LEVEL"
170 PRINT "BY TYPING A NUMBER BETWEEN"
180 PRINT "1 (EASIEST) AND 6 (HARDEST)."
190 VTAB 16:HTAB 1:GOSUB 3000
200 CH = K+1:IF CH < 2 OR CH > 7 THEN 190
210 PRINT K$:SC = 0:TL = 0:HOME
220 GR:HOME:FOR X = 1 TO CH
230 HOLD(X) = INT(RND(1)*7)+1:IF X = 1 THEN 270
240 Y = 1
250 IF HOLD(X) = HOLD(Y) THEN 230
260 Y = Y+1:IF Y > X THEN 250
270 NEXT X:NM = INT(RND(1)*CH)+1
280 IF GA = 2 THEN COLOR= HOLD(NM)+7
290 FOR X = 1 TO 5
300 IF GA = 2 THEN HLINE 19,21 AT X+15:GOTO 330
310 COLOR= 15:PLOT 20,X+15
320 IF SH(HOLD(NM),1)+1 = X THEN PLOT 20+SH(HOLD(NM),2),
,X+15
330 NEXT X:COLOR= 9:HLINE 2,38 AT 26
340 HOME:FOR X = 1 TO 5:FOR Y = 1 TO CH
350 LY = Y*5+((7-CH)*5/2):IF GA = 1 THEN 380
360 COLOR= HOLD(Y)+7:HLINE LY-1,LY+1 AT X+30
370 ON X = 1 GOTO 400:GOTO 410
380 COLOR= 15:PLOT LY,X+30:IF X > 1 THEN 410
390 PLOT LY+SH(HOLD(Y),2),X+30+SH(HOLD(Y),1)
400 VTAB 20*X:HTAB LY+1:PRINT Y
410 NEXT Y,X
420 VTAB 23:PRINT "TYPE THE NUMBER OF THE MATCHING ";
430 IF GA = 1 THEN PRINT "SHAPE,":GOTO 450
440 PRINT "COLOR,"
450 PRINT "OR PRESS <M> FOR MENU."
460 GOSUB 4000:VTAB 21:HTAB 1:GOSUB 3000
470 IF K$ = "M" OR K$ = CHR$(109) THEN 90
480 IN = K:IF IN < 1 OR IN > CH THEN 460
490 PRINT K$:TL = TL+1:IF IN = NM,THEN 510
500 POKE 6,150:POKE 8,255:CALL 768:GOTO 220
510 SC = SC+1
520 IF SC/3 = INT(SC/3) THEN GOSUB 1000:GOTO 220
530 GOSUB 2000:GOTO 220
1000 FOR X = 1 TO 4:FOR Z = 1 TO 2
1010 COLOR= INT(RND(1)*7)+7
1020 FOR Y = LN(X,1) TO LN(X,2) STEP LN(X,3)
1030 POKE 6,1:POKE 8,Y+50:CALL 768
1040 IF X = 1 OR X = 3 THEN TX = Y:TY = LN(X,4):GOTO 1060
1050 TX = LN(X,4):TY = Y
1060 IF Z = 1 THEN PLOT TY,TX:GOTO 1080
1070 COLOR= 0:PLOT TY,TX
1080 NEXT Y,Z,X:IF TL > 0 THEN GOSUB 2000
1090 RETURN
2000 FOR X = 200 TO 80 STEP -20
2010 POKE 6,10:POKE 8,X:CALL 768:NEXT X:RETURN
3000 PRINT ">";
3010 GET K$:K = VAL(K$):RETURN
4000 VTAB 24:HTAB 24
4010 PRINT "SCORE: ";SC;" FOR ";TL;:RETURN
5000 DATA 0,0,0,1,0,-1,2,1,2,-1,4,1,4,-1
5010 DATA 1,39,2,1,1,39,2,39,39,1,-2,39,-39,1,-2,1
6000 DATA 165,8,201,2,176,2,169,2,74,133,10,164,8
6010 DATA 240,8,173,48,192,234,234,136,208,251,56
6020 DATA 165,7,229,10,133,7,176,235,198,6,208,231,96

```

Atari 800/XL/130/XE/*Shapes*

```

10 DIM HOLD(7),LN(4,4),SH(7,2),BL$(1),K$(1),SP$(1),ST$(36)
20 OPEN #1,4,0,"K":POKE 752,1:POKE 82,0
30 BL$=CHR$(160):SP$=CHR$(32)
40 ST$=CHR$(14):ST$(36)=ST$:ST$(2)=ST$
50 FOR X=1 TO 7:FOR Y=1 TO 2:READ A:SH(X,Y)=A
60 NEXT Y:NEXT X

```

PRESCHOOL PROGRAM

```

70 FOR X=1 TO 4:FOR Y=1 TO 4:READ A:LN(X,Y)=A
80 NEXT Y:NEXT X
90 PRINT CHR$(125):POSITION 14,10:PRINT "* SHAPES *";
100 GOSUB 1000:POSITION 9,13
110 PRINT "PRESS ANY KEY TO BEGIN.":GOSUB 3010
120 PRINT CHR$(125):PRINT :PRINT "DO YOU WANT TO PLAY"
130 PRINT "<1> SHAPES OR":PRINT "<2> QUIT?"
140 POSITION 1,8:GOSUB 3000:PRINT CHR$(K):CH=K-48
150 IF CH=2 THEN PRINT CHR$(125):POKE 752,0:END
160 IF CH<1 THEN 140
170 PRINT :PRINT :PRINT "PLEASE SET THE DIFFICULTY LEVEL"
180 PRINT "BY TYPING A NUMBER BETWEEN"
190 PRINT "1 (EASIEST) AND 6 (HARDEST)."
200 POSITION 1,16:GOSUB 3000:PRINT CHR$(K)
210 CH=K-47:IF CH<2 OR CH>7 THEN 200
220 SC=0:TL=0
230 PRINT CHR$(125):GOSUB 4000:FOR X=1 TO CH
240 HOLD(X)=INT(RND(1)*7)+1:IF X=1 THEN 280
250 Y=1
260 IF HOLD(X)=HOLD(Y) THEN 240
270 Y=Y+1:IF Y>X THEN 260
280 NEXT X:NM=INT(RND(1)*CH)+1:FOR X=1 TO 3
290 POSITION 19,4+X:PRINT BL$ 
300 IF SH(HOLD(NM),1)+1=X THEN POSITION 19+SH(HOLD(NM))
,2,4+X:PRINT BL$ 
310 NEXT X:POSITION 2,10:PRINT ST$ 
320 FOR X=1 TO 3:FOR Y=1 TO CH:LY=Y*5+(7-CH)*5/2-1
330 POSITION LY,12+X:PRINT BL$:IF X<>1 THEN 360
340 POSITION LY+SH(HOLD(Y),2),12+X+SH(HOLD(Y),1)
350 PRINT BL$:POSITION LY,16+X:PRINT Y
360 NEXT Y:NEXT X
370 POSITION 6,19:PRINT "TYPE THE NUMBER OF THE SHAPE"
380 POSITION 7,20:PRINT "THAT MATCHES THE ONE ABOVE,"
390 POSITION 8,21:PRINT "OR PRESS <M> FOR MENU."
400 POSITION 14,6:GOSUB 3000
410 IF CHR$(K)="M" OR CHR$(K)="m" THEN 120
420 IN=K-48:IF IN<1 OR IN>CH THEN 400
430 PRINT CHR$(K):TL=TL+1:IF IN=NM THEN 460
440 SOUND 0,200,10,10:FOR DE=1 TO 50:NEXT DE
450 SOUND 0,0,0,0:GOTO 230
460 SC=SC+1:IF SC/3=INT(SC/3) THEN GOSUB 1000:GOTO 230
470 GOSUB 2000:GOTO 230
1000 FOR X=1 TO 4:FOR Z=1 TO 2
1010 FOR Y=LN(X,1) TO LN(X,2) STEP LN(X,3)
1020 SOUND 0,Y+40,10,10
1030 IF X=1 OR X=3 THEN POSITION LN(X,4),Y:GOTO 1050
1040 POSITION Y,LN(X,4)
1050 IF Z=1 THEN PRINT BL$:GOTO 1070
1060 PRINT SP$
1070 NEXT Y:NEXT Z:NEXT X:IF TL>0 THEN GOSUB 2000
1080 SOUND 0,0,0,0:RETURN
2000 FOR X=200 TO 20 STEP -10:SOUND 0,X,10,10:NEXT X
2010 SOUND 0,0,0,0:RETURN
3000 PRINT "<*>";
3010 GET #1,K:RETURN
4000 POSITION 13,23
4010 PRINT "SCORE: ";SC;" FOR ";TL;:RETURN
5000 DATA 0,0,0,1,0,-1,1,1,1,-1,2,1,2,-1
5010 DATA 1,22,2,1,1,38,2,22,22,1,-2,38,38,1,-2,1

```

```

130 PRINT CHR$(153);";* SHAPES";CHR$(156);"; AND";CHR$(154);"; COLORS *"
140 GOSUB 1000:POKE DN,13:POKE OV,9:SYS MV
150 PRINT YL$;"PRESS ANY KEY TO BEGIN.":GOSUB 3010
160 PRINT CL$:PRINT YL$;"DO YOU WANT TO PLAY"
170 PRINT:PRINT "<1> SHAPES OR"
180 PRINT "<2> COLORS, OR":PRINT "<3> QUIT?"
190 POKE DN,7:POKE OV,0:GOSUB 3000
200 IF K=3 THEN PRINT CL$:END
210 IF K<1 OR K>2 THEN 190
220 PRINT K$:GA=K:PRINT:PRINT:PRINT
230 PRINT "PLEASE SET THE DIFFICULTY LEVEL"
240 PRINT "BY TYPING A NUMBER BETWEEN"
250 PRINT "1 (EASIEST) AND 6 (HARDEST)."
260 POKE DN,16:POKE OV,0:GOSUB 3000
270 CH=K+1:IF CH<2 OR CH>7 THEN 260
280 PRINT K$:SC=0:TL=0
290 PRINT CL$:GOSUB 4000:FOR X=1 TO CH
300 HOLD(X)=INT(RND(1)*7)+1:IF X=1 THEN 340
310 Y=1
320 IF HOLD(X)=HOLD(Y) THEN 300
330 Y=Y+1:IF Y>X THEN 320
340 NEXT X:NM=INT(RND(1)*CH)+1
350 IF GA=2 THEN PRINT KOS(HOLD(NM));
360 FOR X=1 TO 3:IF GA>2 THEN 380
370 POKE DN,4+X:POKE OV,19:SYS MV:PRINT RC$:GOTO 420
380 POKE DN,4+X:POKE OV,20:SYS MV:PRINT BL$ 
390 IF SH(HOLD(NM),1)+1<>X THEN 420
400 POKE DN,4+X:POKE OV,20+SH(HOLD(NM),2)
410 SYS MV:PRINT BL$ 
420 NEXT X:POKE DN,10:POKE OV,2:SYS MV
430 PRINT CHR$(28);BARS;CHR$(5)
440 FOR X=1 TO 3:FOR Y=1 TO CH
450 LY=Y*5+(7-CH)*5/2:IF GA=1 THEN 480
460 PRINT KOS(HOLD(Y)):POKE DN,12+X:POKE OV,LY-1
470 SYS MV:PRINT RC$:ON -(X=1) GOTO 520:GOTO 530
480 POKE DN,12+X:POKE OV,LY:SYS MV:PRINT BL$ 
490 IF X<>1 THEN 530
500 POKE DN,12+X+SH(HOLD(Y),1)
510 POKE OV,LY+SH(HOLD(Y),2):SYS MV:PRINT BL$ 
520 POKE DN,16+X:POKE OV,LY-1:SYS MV:PRINT Y
530 NEXT Y,X
540 POKE DN,20:POKE OV,7:SYS MV
550 PRINT CY$,"TYPE THE NUMBER OF THE ";YL$;
560 IF GA=1 THEN PRINT "SHAPE":GOTO 580
570 PRINT "COLOR"
580 PRINT TAB(8);CY$;"THAT MATCHES THE ONE ABOVE."
590 PRINT TAB(10);"OR PRESS <M> FOR MENU.":CY$;
600 POKE DN,6:POKE OV,14:GOSUB 3000:IF K$="M" THEN 160
610 IN=K:IF IN<1 OR IN>CH THEN 600
620 PRINT K$:TL=TL+1:IF IN=NM THEN 650
630 POKE S+4,33:POKE S+1,9:POKE S,104
640 FOR DE=1 TO 150:NEXT DE:POKE S+4,32:GOTO 290
650 SC=SC+1:IF SC/3=INT(SC/3) THEN GOSUB 1000:GOTO 290
660 GOSUB 2000:GOTO 290
1000 POKE S+4,33:POKE S,25:FOR X=1 TO 4
1010 FOR Z=1 TO 2:PRINT KOS(INT(RND(1)*7)+1)
1020 FOR Y=LN(X,1) TO LN(X,2) STEP LN(X,3):POKE S+1,Y
1030 IF X=1 OR X=3 THEN POKE DN,Y:POKE OV,LN(X,4):SYS MV:GOTO 1050
1040 POKE DN,LN(X,4):POKE OV,Y:SYS MV
1050 IF Z=1 THEN PRINT BL$:GOTO 1070
1060 PRINT SP$;
1070 NEXT Y,Z,X:IF TL>0 THEN GOSUB 2000
1080 POKE S+4,32:RETURN
2000 POKE S+4,33:POKE S,55:FOR X=50 TO 500 STEP 25
2010 POKE S+1,X/3:NEXT X:POKE S+4,32:RETURN
3000 SYS MV:PRINT ">";
3010 GET K$:IF K$="" THEN 3010
3020 K=VAL(K$):RETURN
4000 POKE DN,24:POKE OV,13:SYS MV
4010 PRINT YL$;"SCORE: ";SC;" FOR ";TL;CHR$(5);:RETURN
5000 DATA 0,0,0,1,0,-1,1,1,1,-1,2,1,2,-1
5010 DATA 1,23,2,1,1,38,2,23,23,1,-2,38,38,1,-2,1
5020 DATA 28,30,31,129,156,158,159
5030 DATA 174,220,199,172,219,199,24,32,240,255,96

```

Commodore 64/128 (C 64 mode)/Shapes and Colors

```

10 DIM HOLD(7),KOS(7),LN(4,4),SH(7,2)
20 POKE 53280,0:POKE 53281,0:DN=51164:MV=49700
30 OV=51163:S=54272:FOR X=0 TO 23:POKE S+X,0:NEXT X
40 POKE S+5,68:POKE S+6,68:POKE S+24,15:SP$=CHR$(32)
50 BL$=CHR$(18)+SP$:CL$=CHR$(147):CY$=CHR$(159)
60 RC$=CHR$(18)+SP$+$P$+$P$:$YL$=CHR$(158)
70 BARS="":FOR X=1 TO 36:BARS=BARS+CHR$(196):NEXT X
80 FOR X=1 TO 7:FOR Y=1 TO 2:READ SH(X,Y):NEXT Y,X
90 FOR X=1 TO 4:FOR Y=1 TO 4:READ LN(X,Y):NEXT Y,X
100 FOR X=1 TO 7:READ K0:KOS(X)=CHR$(K0):NEXT X
110 FOR X=49700 TO 49710:READ ML:POKE X,ML:NEXT X
120 PRINT CL$:POKE DN,10:POKE OV,10:SYS MV

```

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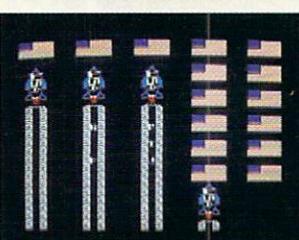
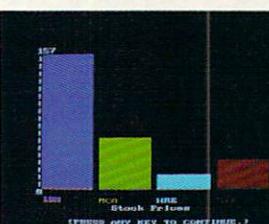
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PRESCHOOL PROGRAM

IBM PC & compatibles/Shapes and Colors

```

10 SCREEN 0,0:KEY OFF:RANDOMIZE TIMER:DEF SEG=&H40
20 IF (PEEK(&H10) AND 48)=32 THEN WIDTH 40
30 DEF SEG:DEFINT A-Z:DEF SEG=SEG
40 BL$=CHR$(219):RC$=STRING$(3,219):SP$=CHR$(32)
50 FOR X=1 TO 7:FOR Y=1 TO 2:READ SH(X,Y):NEXT Y,X
60 FOR X=1 TO 4:FOR Y=1 TO 4:READ LN(X,Y):NEXT Y,X
70 COLOR 10,0:CLS:LOCATE 10,10,0:PRINT "* SHAPES";
80 COLOR 13:PRINT " AND";
90 COLOR 9:PRINT " COLORS *":GOSUB 1000:COLOR 14
100 LOCATE 13,9:PRINT "PRESS ANY KEY TO BEGIN."
110 GOSUB 3010
120 CLS:PRINT:PRINT "DO YOU WANT TO PLAY"
130 PRINT:PRINT "<1> SHAPES OR"
140 PRINT "<2> COLORS, OR":PRINT "<3> QUIT?"
150 LOCATE 8,1:GOSUB 3000
160 IF K=3 THEN COLOR 7:WIDTH 80:KEY ON:END
170 IF K<1 OR K>2 THEN 150
180 PRINT K$:GA=K:PRINT:PRINT:PRINT
190 PRINT "PLEASE SET THE DIFFICULTY LEVEL"
200 PRINT "BY TYPING A NUMBER BETWEEN"
210 PRINT "1 (EASIEST) AND 6 (HARDEST)."
220 LOCATE 16,1:GOSUB 3000
230 CH=K+1:IF CH<2 OR CH>7 THEN 220
240 PRINT K$:SC=0:TL=0
250 CLS:GOSUB 4000:FOR X=1 TO CH
260 HOLD(X)=INT(RND*7)+1:IF X=1 THEN 290 ELSE Y=1
270 IF HOLD(X)=HOLD(Y) THEN 260
280 Y=Y+1:IF Y>X THEN 270
290 NEXT X:NM=INT(RND*CH)+1
300 IF GA=2 THEN COLOR HOLD(NM)
310 FOR X=1 TO 3
320 IF GA=2 THEN LOCATE 4+X,19:PRINT RC$:GOTO 350
330 LOCATE 4+X,20:PRINT BL$
340 IF SH(HOLD(NM),1)+1=X THEN LOCATE 4+X,20+SH(HOLD(NM),2):PRINT BL$
350 NEXT X:COLOR 4:LOCATE 10,2:PRINT STRING$(37,196)
360 COLOR 7:FOR X=1 TO 3:FOR Y=1 TO CH
370 LY=Y*5+((7-CH)*5/2):IF GA=1 THEN 400
380 COLOR HOLD(Y):LOCATE 12+X,LY-1:PRINT RC$
390 IF X=1 THEN 430 ELSE 440
400 LOCATE 12+X,LY:PRINT BL$:IF X<>1 THEN 440
410 LOCATE 12+X+SH(HOLD(Y),1),LY+SH(HOLD(Y),2)
420 PRINT BL$
430 LOCATE 16+X,LY-1:PRINT Y
440 NEXT Y,X:COLOR 3:LOCATE 20,7
450 PRINT "TYPE THE NUMBER OF THE ";:COLOR 14
460 IF GA=1 THEN PRINT "SHAPE" ELSE PRINT "COLOR"
470 COLOR 3:PRINT TAB(8);;"THAT MATCHES THE ONE ABOVE."
480 PRINT TAB(10);;"OR PRESS <M> FOR MENU."
490 COLOR 3:LOCATE 6,14:GOSUB 3000
500 IF KS="M" OR KS="" THEN 120
510 IN=K:IF IN<1 OR IN>CH THEN 490
520 PRINT K$:TL=TL+1:IF IN=NM THEN 540
530 SOUND 200,9:FOR DE=1 TO 150:NEXT DE:GOTO 250
540 SC=SC+1
550 IF SC MOD 3=0 THEN GOSUB 1000 ELSE GOSUB 2000
560 GOTO 250
1000 FOR X=1 TO 4:FOR Z=1 TO 2:COLOR INT(RND*5)+3
1010 FOR Y=LN(X,1) TO LN(X,2) STEP LN(X,3)
1020 SOUND Y*50,.2
1030 IF X=1 OR X=3 THEN LOCATE Y,LN(X,4):GOTO 1050
1040 LOCATE LN(X,4),Y
1050 IF Z=1 THEN PRINT BL$ ELSE PRINT SP$
1060 NEXT Y,Z,X:IF TL>0 THEN GOSUB 2000
1070 RETURN
2000 FOR X=50 TO 500 STEP 25:SOUND X,.3:NEXT X:RETURN
3000 LOCATE ,1:PRINT ">";
3010 K$=INKEY$:IF K$="" THEN 3010
3020 K=VAL(K$):LOCATE ,0:RETURN
4000 COLOR 14:LOCATE 24,13
4010 PRINT "SCORE:":SC;"FOR";TL;:COLOR 7:RETURN
5000 DATA 0,0,0,1,0,-1,1,1,-1,2,1,2,-1
5010 DATA 1,23,2,1,1,39,2,23,23,1,-2,39,39,1,-2,1

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10 CLEAR 500:DIM HOLD(7),LN(4,4),SH(7,2)
20 RC=143:BL$=CHR$(128):SP$=CHR$(32)
30 FOR X=1 TO 7:FOR Y=1 TO 2:READ SH(X,Y):NEXT Y,X
40 FOR X=1 TO 4:FOR Y=1 TO 4:READ LN(X,Y):NEXT Y,X
50 CLS:PRINT@197,"* SHAPES AND COLORS *":GOSUB 1000
60 PRINT@260,"PRESS ANY KEY TO BEGIN.":GOSUB 3010
70 CLS:PRINT:PRINT "DO YOU WANT TO PLAY"
80 PRINT:PRINT "<1> SHAPES OR":PRINT "<2> COLORS, OR"
90 PRINT "<3> QUIT?"
100 PRINT@225,"":GOSUB 3000
110 IF K=3 THEN CLS:END ELSE IF K<1 OR K>2 THEN 100
120 PRINT K$:GA=K:PRINT
130 PRINT "PLEASE SET THE DIFFICULTY LEVEL"
140 PRINT "BY TYPING A NUMBER BETWEEN"
150 PRINT "1 (EASIEST) AND 6 (HARDEST)."
160 PRINT@417,"":GOSUB 3000:CH=K+1
170 IF CH<2 OR CH>7 THEN 160 ELSE PRINT K$:SC=0:TL=0
180 CLS:GOSUB 4000:FOR X=1 TO CH
190 HOLD(X)=RND(7)
200 IF X=1 THEN 230 ELSE Y=1
210 IF HOLD(X)=HOLD(Y) THEN 190
220 Y=Y+1:IF Y=X THEN 230 ELSE 210
230 NEXT X:NM=RND(CH)
240 IF GA=2 THEN KO=16*HOLD(NM):RC$=CHR$(RC+KO)
250 FOR X=1 TO 3
260 IF GA=2 THEN PRINT@46+32*X,RC$,RC$,RC$,:GOTO 290
270 PRINT@47+32*X,BL$;
280 IF SH(HOLD(NM),1)+1=X THEN PRINT@47+SH(HOLD(NM),2)
+32*X,BL$;
290 NEXT X:PRINT@162,STRING$(28,140)
300 FOR X=1 TO 3:FOR Y=1 TO CH
310 IF GA=2 THEN KO=16*HOLD(Y):RC$=CHR$(RC+KO)
320 LY=Y*4+11-2*CH
330 IF GA=2 THEN PRINT@LY+193+32*X,RC$,RC$,RC$,:IF X=1
THEN 360 ELSE 370
340 PRINT@LY+194+32*X,BL$,:IF X<>1 THEN 370
350 PRINT@LY+194+SH(HOLD(Y),2)+32*X+32*SH(HOLD(Y),1),BL$;
360 PRINT@LY+289+32*X,Y;
370 NEXT Y,X
380 PRINT@386,"TYPE THE NUMBER OF THE ";
390 IF GA=1 THEN PRINT "SHAPE" ELSE PRINT "COLOR"
400 PRINT TAB(3);;"THAT MATCHES THE ONE ABOVE."
410 PRINT TAB(5);;"OR PRESS <M> FOR MENU."
420 PRINT@102,"":GOSUB 3000
430 IF K$="M" OR K$=CHR$(109) THEN 70 ELSE IN=K
440 IF IN<1 OR IN>CH THEN 420 ELSE PRINT K$:TL=TL+1
450 IF IN>NM THEN SOUND 50,3:FOR DE=1 TO 150:NEXT DE:
GOTO 180
460 SC=SC+1:IF SC/3=INT(SC/3) THEN GOSUB 1000:GOTO 180
470 GOSUB 2000:GOTO 180
1000 FOR X=1 TO 4:FOR Z=1 TO 2:KO=RND(4)
1010 FOR Y=LN(X,1) TO LN(X,2) STEP LN(X,3)
1020 SOUND Y*4,1
1030 IF X=1 OR X=3 THEN T=LN(X,4)+32*Y ELSE T=Y+32*LN(X,4)
1040 IF Z=1 THEN PRINT@T,CHR$(RC+KO*16); ELSE PRINT@T,
SP$;
1050 NEXT Y,Z,X:IF TL>0 THEN GOSUB 2000
1060 RETURN
2000 FOR X=50 TO 240 STEP 20:SOUND X,1:NEXT X:RETURN
3000 PRINT ">";
3010 K$=INKEY$:IF K$="" THEN 3010
3020 K=VAL(K$):RETURN
4000 PRINT@488,"SCORE:":SC;"FOR";TL;:RETURN
5000 DATA 0,0,0,1,0,-1,1,1,-1,2,1,2,-1
5010 DATA 1,11,2,1,1,39,2,23,23,1,-2,39,39,1,-2,1

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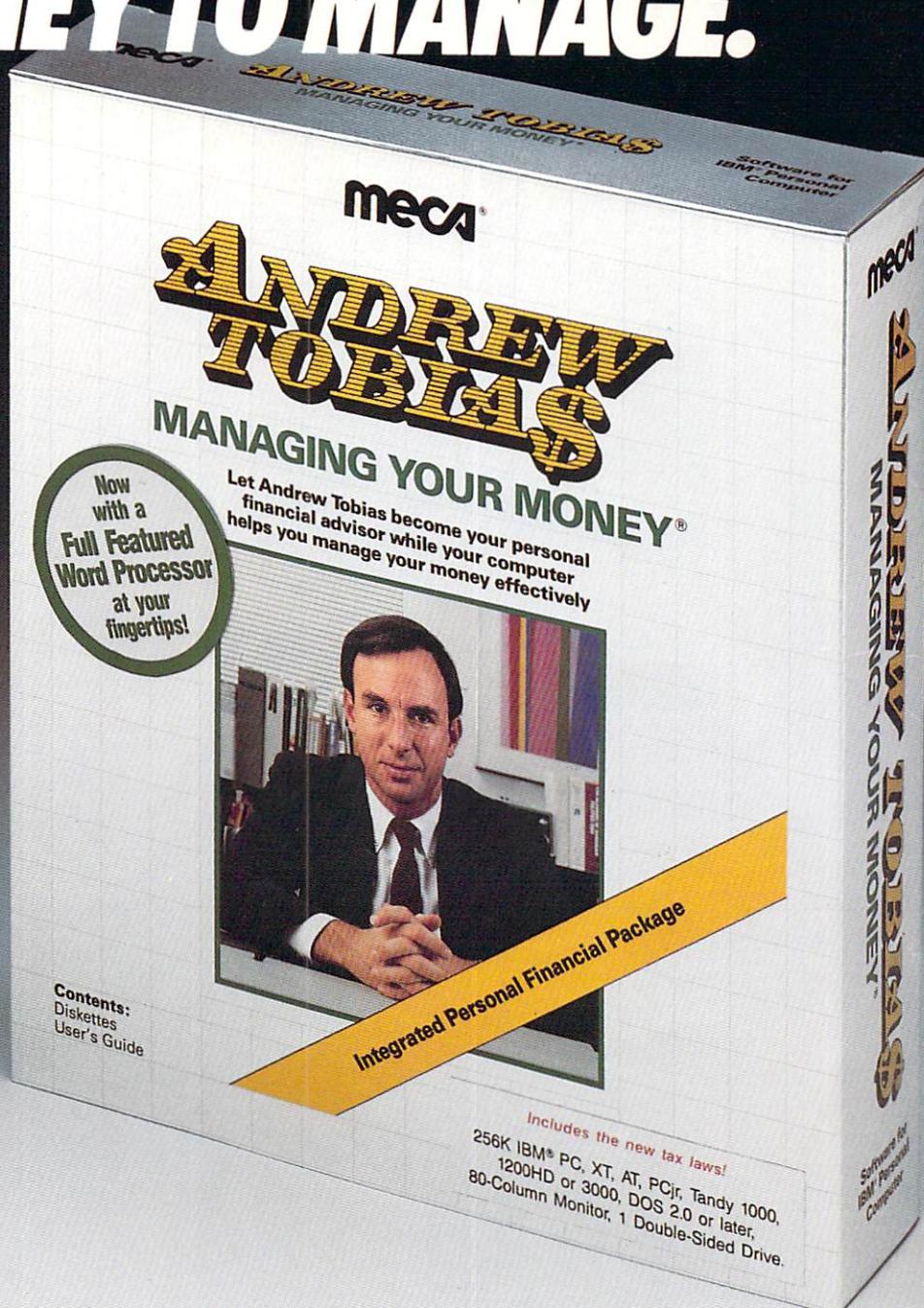
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